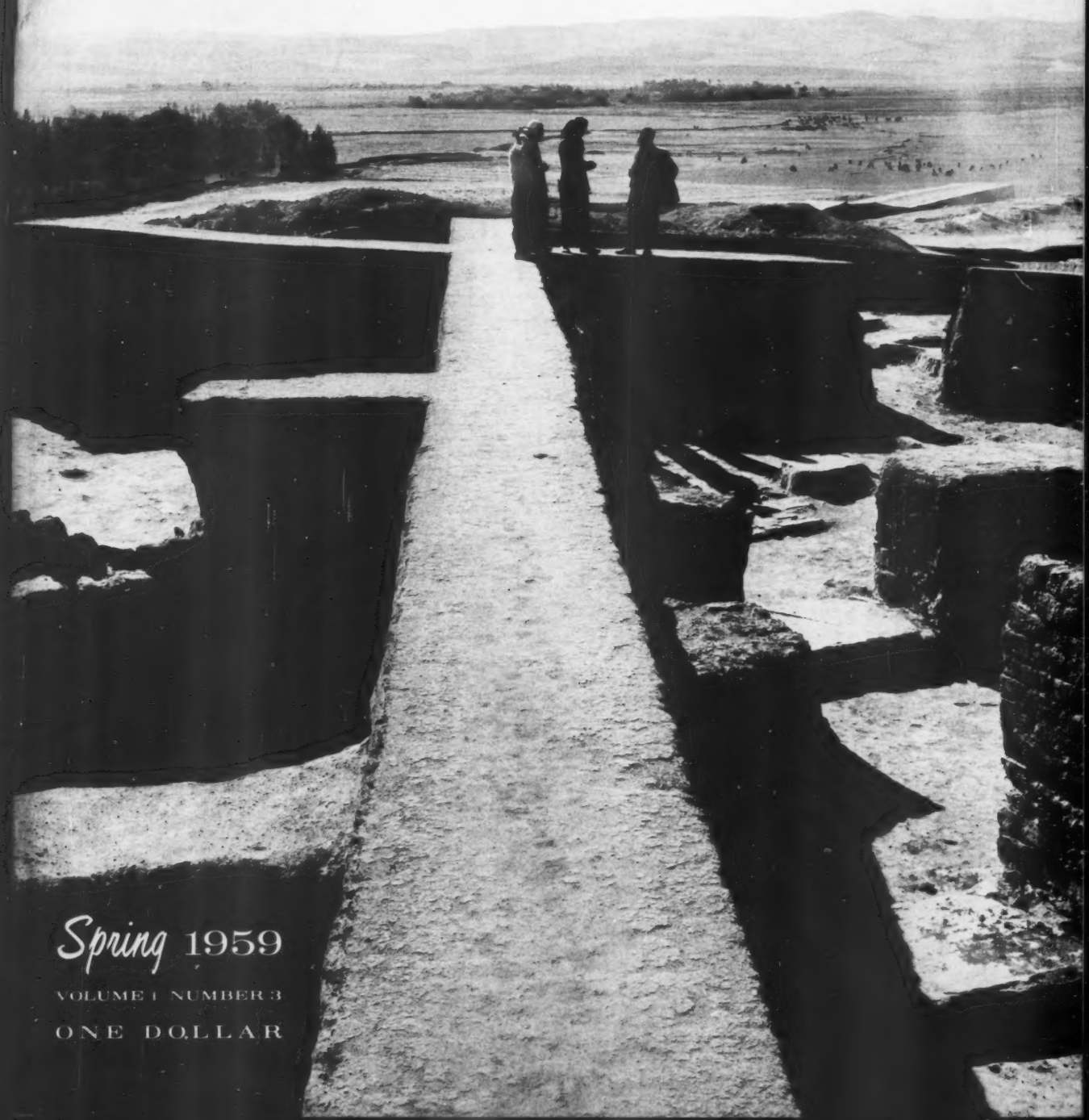
EXPEDITION

THE BULLETIN OF THE UNIVERSITY MUSEUM
OF THE UNIVERSITY OF PENNSYLVANIA



Spring 1959

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ONE DOLLAR

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(Cover) View along balk separating excavated areas at Hasanlu, Azerbaijan, Iran. Doorways to the right belong to the Burned Building of the ninth century B.C. excavated by a Joint Expedition of the University Museum and the Iranian Archaeological Service.

PHOTOGRAPH BY LOOMIS DEAN, COURTESY LIFE MAGAZINE

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IN THIS ISSUE

Volume 1 *Number 3*

A SUMERIAN DOCUMENT WITH MICROSCOPIC CUNEIFORM 2
Samuel Noah Kramer

DIGGING IN IRAN: HASANLU, 1958 4
Robert H. Dyson, Jr.

THE HASANLU BOWL 19
Edith Porada

CLEVER PEOPLE, THESE ARMENIANS 23
Carleton S. Coon

DOUBLE TROUBLE 24
Elizabeth K. Ralph

TE-MOANA-NUI-O-KIWA 26
Marianne L. Stoller

WHAT IN THE WORLD? 39

MUSEUM NEWS 40

THE AUTHORS 40

SUGGESTED READING 40

EXPEDITION

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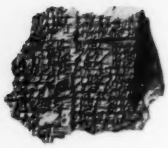


A Sumerian Document with Microscopic Cuneiform

SAMUEL NOAH KRAMER

THE Department of Oriental Antiquities in the Louvre in Paris is the fortunate possessor of the remains of a Sumerian document inscribed more than thirty-five hundred years ago with what are by all odds the most minute cuneiform characters yet known. In the course of the past hundred years or so tens of thousands of cuneiform documents have been excavated, and some of these are inscribed with rather small and crowded writing. But, as far as I know, none has been found inscribed with such microscopic a script as that on the piece in the Louvre. The characters are so minute, that we wonder how the ancient scribe succeeded in writing them, and how, once written, he could read them without magnifying glass or microscope.

The Louvre has thirty-one tiny fragments of this unique document, the original size of which is uncertain. The largest of these fragments is about an inch square. Small as it is, this fragment contains the remnants of more than thirty lines of text, and some six to seven times as many signs as an ordinary cuneiform tablet. The remaining thirty fragments are all much smaller. About half of them are tinier than the paring of a finger nail, but even some of these contain remnants of several lines of writing. All in all, it is not unlikely that in its original state, the Louvre document contained several thousand lines of text, far more than any cuneiform tablet or prism as yet unearthed.

To judge from its extant remains, the Louvre document was inscribed with an entire cycle of laments revolving about the Sumerian goddess of love, a deity who sparked the imagination of men all over the ancient world: Venus to the Romans, Aphrodite to the Greeks, Ishtar to the Babylonians, she was celebrated in Sumerian song and hymn, myth and ritual, under the name Inanna, "Queen of Heaven."

The microscopically written laments on the Louvre document probably fall into two major groups. In the one, the goddess mourns the destruction of her temples throughout Sumer. For in the centuries immediately preceding and following 2000 B.C., Sumer suffered several catastrophic and devastating invasions, which left bitter and painful memories. So much so, that the Sumerian poets were moved to create a special literary genre, the "lamentation," forerunner of the Biblical Book of Lamentations, to mourn and bewail Sumer's sorry plight. Not a few of these laments were put in the mouth of Inanna, who, not unlike "Rachel weeping for her children," was said to wander about Sumer bemoaning the loss of her people, cities, and temples.

The other group of Inanna laments concerns the death of her lover and husband, the shepherd god Dumuzi, the Biblical Tammuz. But hereby hangs a tale told in a Sumerian myth, which shows that the Sumerian goddess of love was ambitious, aggressive, vindictive, and cruel.

In the myth, Inanna, although well aware that she was acting counter to the divine laws, descended to the Nether World in order to become "Queen of the Nether World" as well as "Queen of Heaven." Once there, however, she was put to death by the queen of the lower regions whose position she had wanted to usurp. Or, as the poet puts it:

> She fastened her eye upon her, the eye of death,
> Spoke the word against her, the word of wrath,
> Uttered the cry against her, the cry of guilt,
> The sick woman [Inanna] was turned into a corpse,
> The corpse was hung from a nail.

Luckily for Inanna, however, Enki, the Sumerian god of wisdom came to her rescue and had her revived with the help of the "food of life" and of the "water of life." But though Inanna was alive once again, her troubles were not over. For it was an unbreakable law of the Nether World, "the Land of No Return," that no one who entered its gates could return to the world above unless he produced a substitute to take his place, and Inanna was no exception. She was indeed permitted to reascend to the earth, but only in the company of seven heartless

demons, who had instructions to bring her back forcefully if she should fail to provide another deity to take her place. Several gods, fearing that they might be the intended victims, saved themselves by prostrating themselves in dust and ashes before Inanna. But Dumuzi, Inanna's husband, was too proud to grovel in the dirt before his spouse; instead, "he put on a noble robe, sat high on his seat." This so enraged Inanna that she turned him over to the demons who carried him off to the Nether World, never to return.

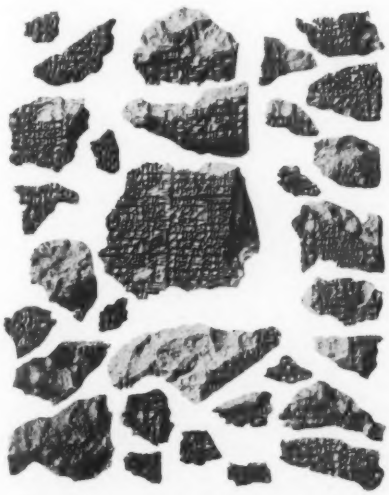
But Inanna must have lived to rue her hasty, cruel act. Forever after, according to the Sumerian poets, she wandered over the land bewailing the death of her lover and husband in poetic words, bitter and poignant. It is not improbable that a number of these laments were inscribed on the Louvre document.

Typical of the phrasing and contents of the Inanna laments, is the following broken passage from the large fragment of the Louvre document, which is restorable and intelligible at least in part:

Oh, her heart! Oh her heart!
Lo! Lo! Oh her heart! Oh her heart!
My Queen, Oh her heart! Oh her heart!
Inanna, Oh her heart! Oh her heart!
The princess, her heart cries out in tears,
Her heart cries out in tears and wails,
Like the stall, her destruction . . . .
Her heart . . . . ,
Her heart . . . . ,
For the mighty (?) one . . . . ,
The stall is destroyed. . . .

The Louvre document was excavated some eighty years ago in the ancient city of Lagash, where the French conducted the excavations which in a sense discovered the Sumerians, for here were found the first important Sumerian monuments, as well as over a hundred thousand Sumerian tablets and fragments. Because of the minuteness of the signs and its fragmentary condition, the Louvre piece has remained unpublished all these years. Since I have devoted practically all my scholarly career to Sumerian literature, Messieurs André Parrot and Jean Nongayrol, the curators of Oriental Antiquities in the Louvre have generously permitted me to make a thorough study of the document for future publication in the Revue D'Assyriologie, a French journal devoted to cuneiform studies. It will add little that is new and revealing about Inanna and her tears and fears. But, perhaps, that may be all to the good—to judge what we already know about the not too lovely Sumerian goddess of love.

The largest fragment enlarged approximately thirteen times.



The thirty-one tiny fragments of the Sumerian document shown actual size.

Workmen shoveling dump over the southwestern edge of the Citadel Mound before the arrival of wheelbarrows.

Digging in Iran: Hasanlu, 1958

ROBERT H. DYSON, JR.

EXPEDITIONS, especially archaeological ones, often produce unexpected results. The last Hasanlu Expedition was no exception. It started slowly with what seemed an interminable delay in the arrival of equipment, and the dull but necessary job of clearing away the accumulated debris of winter.

Having previously opened a number of graves belonging to people who had been buried with an interesting kind of grey-black pottery, we were anxious to explore the high "Citadel Mound" in the center of the site in search of their houses and whatever other remains of their Iron Age culture we might find. Their pottery, often in the shape of long-spouted pitchers, relates them to peoples already known farther to the east in Iran at Tepe Sialk (Kashan) and Tepe Giyan (Nihavand). Their culture appears to be the end of a long development which began back in the third millennium B. C. The problem of the origin and movement of this grey

PHOTOGRAPH BY HAROLD JOSIF

Aerial view of Hasanlu looking northwest. Citadel and Outer Town occupy the entire area back to the row of trees. 1958 excavations were conducted at left center inside circular World War II trench by the Joint Expedition of the University Museum and the Iranian Archaeological Service.

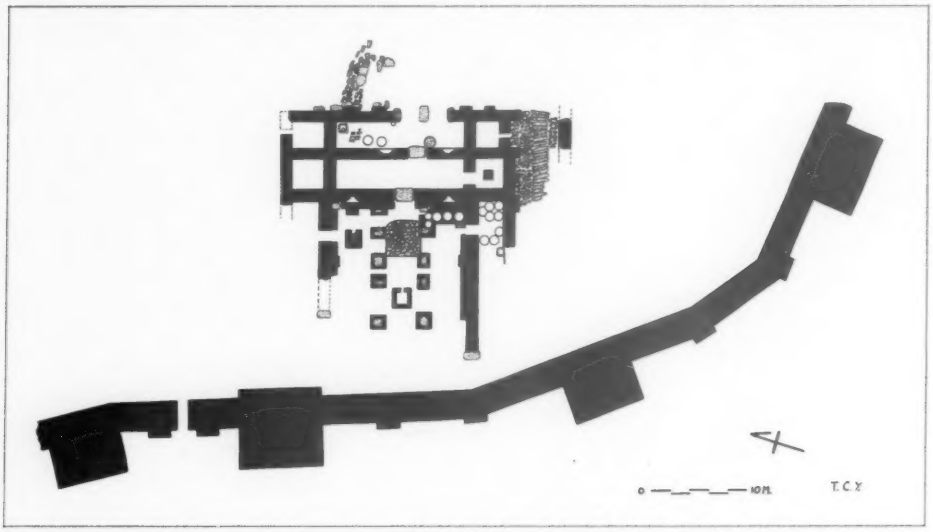
pottery is one of the most fascinating questions in the prehistory of Iran; and indeed, of Asia generally. Related wares are found as far west as Greece and as far east as the North China plain; but their relationships to one another elude us. The directions in which the potters moved, the time involved, and the identities of the peoples using the pottery are all subjects of speculation and research. At Hasanlu we have one of the places where a late type of this pottery was being made during the "Dark Age" which preceded the establishment of the Median and Achaemenian Empires in the seventh and sixth centuries B. C. Small wonder that our digging fingers itched to get started!

The Citadel Fortification Wall

We began by taking a long careful walk around the top of the mound discussing as we went the problem of what various surface bumps might mean, and how we were to dispose of the excavated dirt without piling it on the mound we were trying to excavate. Dirt disposal is a constant problem to the excavator, and more than one project has found itself bogged down through inadequate planning. The problem was not an easy one. The Citadel is surrounded on all sides by the low Outer Town. This meant that we had either to surrender a section of the Outer Town, or to carry the earth down a thirty degree slope and across a flat to the distant edge of the occupational debris. As such a long distance clearly was economically unfeasible, we did the former, dumping down the steep south slope of the Citadel away from the prevailing northerly wind. The horizontal surface above this slope exhibited several interesting flat mounded areas surrounding the highest point of the mound (some seventy feet above canal water level). An exploratory trench the year before (Operation VII) on the north slope had indicated to us the presence of large stone foundations belonging to walls which encircled the Citadel, defending it from attack. Looking for these same structures on the southern side we now cut a northerly trench (Operation IX) in from the south slope. The new Operation sliced neatly through a mass of fallen burned brickwork at its northern end, and across a massive wall foundation at the other end. The foundation, built of large boulders and blocks of limestone, had once supported a high sun-dried brick fortification wall, over nine feet thick. The location of the foundation shows that the wall once encircled part, if not all, of the Citadel Mound.

At one of our regular morning tea breaks we held a conference on tactics and strategy, and decided to proceed with the excavation of a section of this wall while waiting for the arrival

DRAWING BY T. CUYLER YOUNG, JR.



Plan of ninth century B.C. Citadel Wall and Burned Building excavated in 1958 at Hasanlu.

General view of the Solduz Valley looking south from Hasanlu. The foundations of the Citadel Wall are being exposed in the foreground. The Valley is farmed with irrigation, the hilly slopes nearby with rainfall.

of our mechanical equipment. The advantage of this procedure was that we could dump onto the selected slope without having to pile mounds of loose dirt on top of the mound which would have required the wasteful use of our labor force endlessly moving sterile earth from place to place to get it out of the way. While this project developed, other teams of about ten men each made exploratory trenches on the southeastern and northeastern slopes in an effort to locate the fortification wall on these sides. Alas, the history of the mound was not so simple, and we recovered sections of a later wall, including a small gateway to the southeast, but nowhere the wall for which we searched. Our activities told us only that later and more poorly constructed walls existed above a burned level. The over-all plan of our big wall remained obscure.

The section of that big wall excavated, however, turned out to be very imposing. It has four large towers spaced about thirty feet apart along its outer face. Between each tower a pair of rectangular bastions strengthen the main body of the wall. The westernmost pair flank a narrow entrance passage paved with huge slabs of limestone. As the local valley provides no suitable stone outcrops from which such slabs might have been obtained, we must imagine a

MAP BY A. ERIC PARKINSON

continuous stream of wagons creaking across the plain for a distance of at least ten miles bearing heavy burdens of rock taken from the lake shore or mountains. Although none of these stones was cut or fitted except in a rough fashion, their size (some were six feet long!) and the volume of material used indicate the expenditure of a great deal of coordinated energy in the construction of the Citadel defenses. We may imagine the local governor or prince mounted on his horse at some high point on the mound directing the multitude of building activities. One wonders, of course, what occupied the Citadel before the big wall was built. Was it an older abandoned mound being reoccupied? Or had some previously prosperous town fallen to a new conqueror? The answers to such questions lay all summer in the soil beneath our feet, and await discovery with a new season of work.

The project now reached a critical point. We could not spend the rest of the summer chasing a wall—but as yet we did not have our wheelbarrows and other equipment. What to do? Before we could solve this problem, fate, in the form of a telegram announcing the arrival of our baggage at the railhead in Maragheh, eighty miles away, did it for us. At the same moment my assistant, T. Cuyler Young, Jr., arrived in camp from a supply trip to Rezaiyeh wide-eyed with wonder. We too were wide-eyed when we climbed to the top of the mound and saw the tanks and trucks of the Iranian army rumbling through the twilight across our quiet plain! The Iraq government had collapsed. With no radio (a luxury our budget did not allow) we were reduced to reliance on our foreman's reports on the outside world. It was an awkward predicament: unable to calculate the exact state of affairs, and unable to communicate with anyone in less than a week. Caroline Dosker, our Registrar and Camp Manager, Cuyler, and I conferred on what to do. I offered them the choice of staying or going. They voted to adopt our standard "Persian approach" to the problem; namely, to wait and see, because "something will happen—one way or the other." So with that, Cuyler and I set off to collect the baggage—a simple four hour drive to Maragheh, a couple of hours to unload the equipment from the train, and a four hour drive home. A good day's work, especially as visualized in the mind of the innocent westerner who knows that the secret of success is planning. And that well-laid plans work like clockwork. They do too—if you use the right clock!

All in a Day's Work

We "began" leaving at six A.M. (the phrase is used advisedly for there is no such thing in the East as an instantaneous action; things do not "occur," they come into a state of being and pass out of it again over an indeterminate period of time). At three P.M. we arrived at the deserted railway station after drowning the engine fording a stream and experiencing other little mechanical adventures. We could see "Cyrus," our new truck, and the crates of equipment resting on a flat car. At five P.M. the station master appeared and informed us in Persian that we couldn't unload the flatcar without the receipt. The latter was in the possession of our second Iranian Inspector, Mr. Asgharion, who was nowhere to be found. We had already combed the town without finding him. "Oh," announced the paunchy station master, "He will not be here until two days from now. I have a telegram for you!"

Armed with that bit of strategic information we trudged back to the garage where the one-eyed mechanic was prying into the engine of our antique jeep "Darius" by the light of a Coleman lantern. If we returned to Hasanlu we would be just in time to turn around and come back again! And the engine of the car was being most uncooperative. If we waited two days, Caroline wouldn't know what had happened to us, as a telegram would not arrive at Hasanlu before we did. On the other hand, if we stayed, Tabriz, the "good garage," and the Consul were "only a three hour" drive north. If we were to go there we could have a drink, a hot bath, see Mr. Josif, the Consul, and have the car checked. So, at nine P.M. we departed for Tabriz. At 9:15 we arrived back in town at the garage, having had more trouble with "Darius." At ten we departed again for Tabriz where we arrived at two o'clock the following morning!

Two days later we were back at the station in Maragheh unloading our equipment from the train and putting it into a big truck. At nine o'clock that evening we started for Hasanlu, exhausted and unhappy about our three day absence. At one A.M. as we approached the town of Mahabad we were arrested at rifle-point by the Iranian army which had reimposed travel control and didn't know who we were. At ten the next morning, after a cold night in the car and after being interviewed by numerous officers, the commanding general finally allowed us to proceed to Hasanlu where we arrived in time for lunch. All in a day's work!

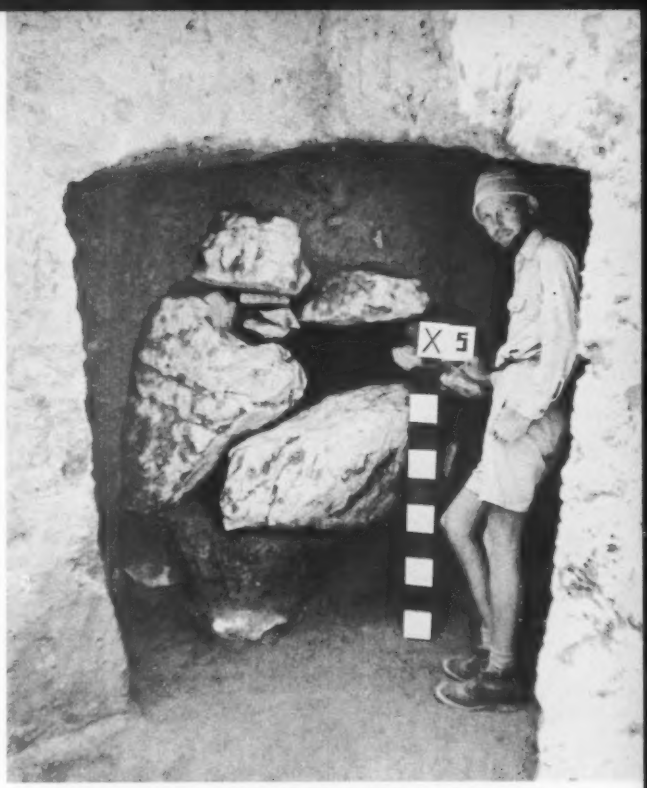
With the equipment at hand, and the staff reassembled, the expedition was now able to turn to with real enthusiasm. The Operation tracing the wall was concluded, and the process of clearing the quadrant enclosed by it (which contained a burned structure) was started. A grid of eleven-meter squares (XXI-XXVI) was surveyed to provide controls in digging area by

area. Such a procedure insures adequate supervision of the workmen, while the vertical sections visible on the balks after excavation act as checks on the accuracy of the stratigraphy determined in digging. At the same time, besides two soundings in nearby Chalcolithic mounds, we carried out an additional sounding in the Outer Town. This latter Operation (X) confirmed our previous conclusions that the Outer Town dates back to about 2000 B.C., and also provided our first rock tomb.

The Citadel: Late Remains

In the aerial photographs, and on the ground, traces of walls and towers belonging to a late fortification may be seen on top of the mound. These belong to a structure of the Islamic Period as indicated by the type of small square brick found just under the present surface. Below the shallow remains of this eroded brickwork the soil is disturbed by various deep pits filled with grey rubble—testimony no doubt to the erratic activities of former treasure hunters. In two instances we came upon solitary skeletons resting in stone-lined graves. Graves of this type are abundant at Ashur and Babylon during the Parthian Period (249 B. C.—A. D. 226)—the equivalent of the Roman Period in the west. At this time, it would appear, the settlement at Hasanlu was elsewhere than on the Citadel Mound. Fragments of glass found in the vineyards to the south suggest its possible location.

The graves themselves lay in the debris of an earlier period represented by wall foundations and floors. These belonged to houses which had been built against the Citadel Wall following its restoration with a strengthened West Gate after a period of abandonment. To this general time also belong a small Postern Gate on the southeastern slope, fragments of defensive walls on the east and north slopes, and a house with a paved courtyard in the Outer Town. All of these buildings with their more-or-less square rooms sprawl unevenly over the areas they occupy. They were constructed of mud brick set on foundations of roughly squared stones, many of which had been taken from earlier structures. None of the fine grey pottery known from the cemetery was found in this level. Instead, we discovered potsherds of a thin orange-buff pottery with a high polish, decorated with hanging triangles in a purplish-brown paint. In type of finish, fabric, shape, and in one case pattern, these sherds may be most closely compared with those we collected from Ziwiye in 1956. This latter site lies some distance south of Hasanlu in Kurdistan, and is the source of the famous Ziwiye Treasure (several pieces of which we have in our Museum collection). One vessel of



Rock tomb discovered in Operation X. The corner of the balk has been cut away to facilitate entrance to the tomb which is dated several centuries earlier than the Burned Building.

well-polished red pottery was also found. This is of a type known from the Urartian site of Toprak Kale near Lake Van in eastern Turkey where it is dated to the middle of the eighth century B. C. A similar date has been suggested for the Ziwiye materials. It would seem reasonable, therefore, to suggest that, on present evidence, the later remains at Hasanlu also ought to date to the eighth century or later.

The Citadel: Period of the Burned Building

As our wheelbarrows hauled away the debris of the later occupation it became apparent that the underlying Grey Ware Period had ended abruptly with the sacking of the city. The intensity and suddenness of this event were demonstrated by the masses of fallen, partially burned brick which filled rooms and was heaped against the Citadel Wall, and by the distorted bodies of men trapped in the collapse. We now realized that similar conditions in a house in the Outer Town excavated last year, and many evidences of burned soil around the site indicate that the entire city had been put to the torch. By whom we do not know. The significance of the period of abandonment which followed became clear: the bronze casters, the pottery makers, the builders of the wall—all had died in the

flames, had been slaughtered on the ramparts, or had been carried away into slavery. The manufacture of polished grey pottery ended abruptly; no survivors searched the ruins for the treasures left there; no townsmen were buried again in the cemetery with their bronze and iron jewelry. A way of life had ended. In the succeeding days of silence the wind and rain had eaten into the ruins, packing down the debris and piling it against the Citadel Wall.

The Burned Building: Palace or Temple?

From under a mantle of red dust and fallen brick emerged a large building facing a big courtyard or street which once had been paved with slabs of sandstone and limestone. The eastern façade of the building, over eighty-four feet in width, is broken by a central doorway some twenty feet wide. The outer wall on either side is divided by pilasters into three equal sections. The entrance itself is subdivided by the limestone base for a central lintel support. Similar supports of red sandstone lay at either side of the door at the base of the jamb. The outline of a pair of round columns can be seen on the surface of each, while their impressions are preserved in the mud plaster facing of the walls. The walls flanking the door are still standing to a height of over six feet, and the door was undoubtedly higher still. The volume of brickwork filling the rooms indicated that we were dealing with what had been a two-story structure. This inference was upheld when we drew the section of the balk, as well as by the discovery of many objects on a collapsed floor above the ground floor.

Looking through the main entrance, one faces across a long narrow room toward a smaller doorway with a large limestone sill. The door is flanked on either side by a crenellated niche built into the brick part of the walls above the free-standing stone foundation. The large square bricks are like those found at Hamadan and Persepolis in buildings of the Median and Achaemenian Periods (seventh to fourth centuries B.C.). To the left of this doorway stands a round stone drum. At first we thought that this might have been a column base, but closer inspection showed that the front edges are highly polished from wear. We concluded, therefore, that, while it could have served at some time as a column base, in its present location it must have served some other function. Equally mysterious is a brick-edged hole in the floor at the opposite end of the room. Sitting in this opening was a large pottery jar decorated with raised spirals. The spiral pattern was a surprise as it has been assumed to be characteristic of the Early Bronze Age. We now know from this example, and others, that it was also being used in the Early Iron Age at Hasanlu.

View of main entrance to Burned Building looking southwest. Note the free-standing stone foundation under brickwork of rear wall and the stone drum to left of doorway. Men are standing on unexcavated balk.

PHOTOGRAPH BY LOOMIS DEAN, COURTESY LIFE MAGAZINE

Passing through the small door, one leaves the East Room and enters the parallel West Room. Ahead lies a similar door leading through to the West Court. All three of these doorways, like those in the Northwest Palace of Ashurnasirpal II at Nimrud, are sufficiently out of alignment to prevent an easy view from one court to another. At each of the shorter ends of the West Room a narrow doorway leads into a small adjoining room. The northern of these doorways had been blocked up with mud brick while the building was still in use. The isolated room was quite empty, but its counterpart to the south is furnished with a small stone podium or table. This feature, together with the use of niches, suggests a religious function of some sort, but does not provide sufficient evidence on which to base concrete conclusions. The main West Room was otherwise quite plain and no doubt quite dark, as it relied primarily upon light reflected from its white-washed walls for illumination.

We discovered with interest that the East Room was also bordered to north and south by a small room. Strangely enough, these little rooms could be entered only from outside the building. Not only that, but they were very small with exceedingly narrow entrances. The southern, or Refuse Room, was filled with black organic soil and animal bones, mainly sheep or goat, and broken grey ware saucers or dishes. There was no indication of how this refuse had entered the room—whether through a hole in the wall from the Podium Room, or through the ceiling from the second floor. The selective nature of the material suggests that the room had a special function, but whether it was simple kitchen refuse or some ritual by-product we could not determine. The room on the north also had rich earth on its floor and some bones, but not as many, and the less abundant pottery was of no special type. The narrow entrances were obviously to permit periodic cleaning.

The West Court filled the area between the building and the Citadel Wall. It was a simple roofed-over structure, one story high, with side walls set on a single course of small stones. Light and air were provided through a central opening in the roof, indicated by a paved area on the floor equipped with a sunken storage-jar drain. Storage rooms entered by small doorways flanked

Foundations of Citadel Wall looking south. Caroline G. Dosker, Field Registrar, sits on the edge of the West Gate. Bastions flank the outer sides of the Gate. Foundations of Tower 3 fill the background; a small section of Tower 4 shows in the foreground.

the court on the north and south. The South Storage Room had had a wooden door mounted on a stone door socket. The fact that the walls of these storage rooms are slightly out of alignment with those of the main building shows that the court had been added as a separate unit. Its roof was supported by a double row of wooden pillars set upon stone slab bases. The exit from the West Room is flanked on either side by a pilaster which, in turn, flanks a crenellated niche of the type already described in the East Room. The pilasters are in line with the two rows of pillar bases. A clay bench had been built around three sides of the court against the walls. In the center of the northern section of the court is a small hearth of paving stones surrounded by a low mud wall. The bench in front of this has a built-in surface of paving stones set directly in front of the niche and running down the face of the bench to a larger rectangle of paving stones on the floor. Nothing lay beneath these stones. The section of the bench in front of the other niche, and the niche itself, had been obscured by the construction of a much wider mud platform into which a number of large storage jars had been set. These apparently held some sort of liquid, most likely beer or wine, as indicated by the remains of pottery funnels on the floor, and by the rings on the inside of the jars marking the level of the contents at the time of the fire.

As we dug down into the debris we came upon a mass of iron lanceheads and fragments of sword blades lying in the uppermost part of the fill—perhaps from the roof. Farther down and under collapsed brickwork we found the remains of quantities of objects which had been housed on the second floor. The East Room alone produced almost two hundred. These include a rich variety of carved stone bowls, copper vessels and pieces of paraphernalia, fine polished pottery jars made in imitation of metal shapes, domestic pottery, beads of carnelian and glass, bronze maceheads, bronze buttons, and fragments of a bronze lion figurine. A number of these objects were identical to those excavated in the late graves of the Grey Ware Cemetery; so we knew at once that we had found the buildings which belonged to the people buried there.

Among the more interesting objects were fragments of glazed wall tiles. One of these is in the style of ninth century Assyria. Another is decorated with a unique human head in the round. Another prize is a bronze stand with four animal claw feet and a double ring top. It is decorated with raised animal and human figures. All of these items have now been added to our Philadelphia collection where they are being cleaned and studied.

Still another beautiful piece is a silver cup, about eight inches in height, decorated with two registers of applied electrum figures. The upper register represents a victory scene with a chariot, prisoners, and soldiers; the lower, a lion and horse in heraldic opposition flanked by archers. The cup, like the bronzes, has not yet been cleaned and cannot at present be adequately illustrated. One interesting point, however, is that it had been stored away wrapped in cloth, the impression of which is preserved in the surface corrosion. The style of the decoration is totally different from that on the other major art treasure recovered, the gold bowl.

This latter object, which we propose to call simply the "Hasanlu Bowl," is eight inches in height and eight in original diameter. It is made of solid gold about 3/16ths of an inch thick, and weighs over two pounds. From the position in which it was found in the Refuse Room, it is clear that it was being carried out of the flaming building by one of three men who were on the second floor at the moment it gave way. The leader of the group fell sprawled forward on his

PHOTOGRAPHS BY REUBEN GOLDBERG

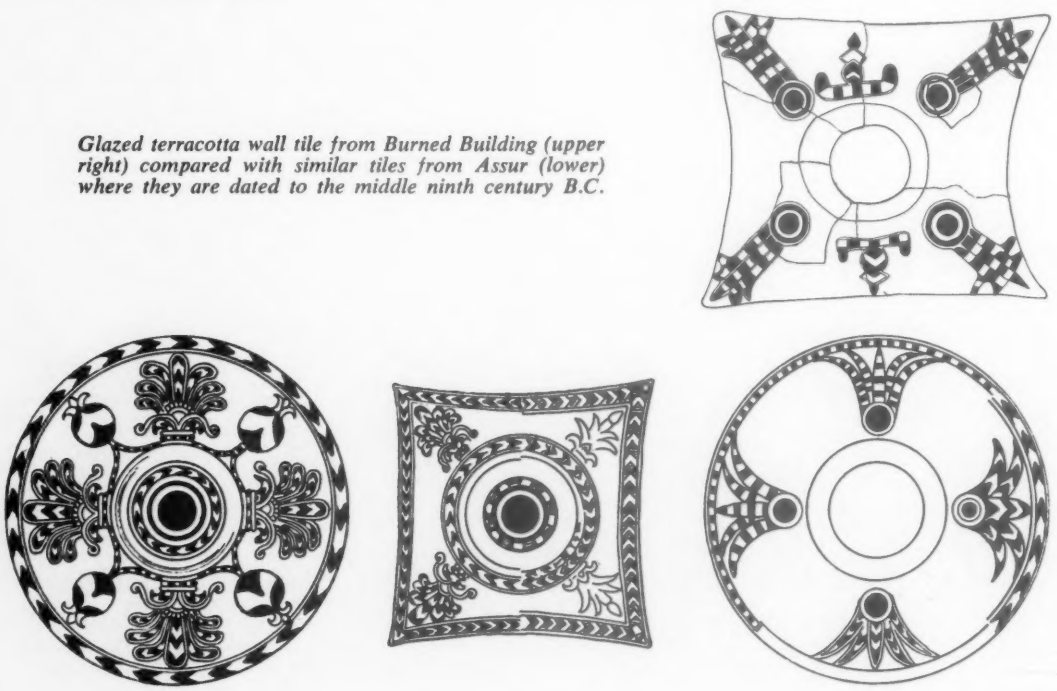
Objects from the Burned Building of the ninth century B.C.: bronze bird handle (width 4½ inches), bronze macehead (diameter 3 inches), bronze stand (height 16¼ inches), and glazed terracotta wall tile with projecting head (4¾ inches from front to back).

face, his arms spread out before him to break the fall, his iron sword with its handle of gold foil caught beneath his chest. The second man, carrying the gold bowl, fell forward on his right shoulder, his left arm with its gauntlet of bronze buttons flung against the wall, his right arm and the bowl dropped in front of him, his skull crushed in its cap of copper. As he fell, his companion following on his left also fell, tripping across the bowl carrier's feet and plunging into the debris. The weight of the walls and the suddenness of the collapse were so great that the edge of the third man's jaw was driven through the upper end of his arm like a knife, and remained in that position when we unearthed it. He carried an iron sword and a star-shaped macehead of bronze mounted on a wooden handle. His tunic was fastened at the neck with a simple copper pin.

With the finding of the bowl, life became very complicated. Interest in the contents of the mound went up sharply in the village, and the need for greater security became urgent. During the following days while Charles Burney, our British colleague, and Mr. Assefi, our Iranian Inspector, were drawing the vessel, we were joined by two soldiers who pitched camp on the mound and patroled the house during the night. The story was told in the villages that a great serpent lived in the mound, and that it was unsafe to go there after dark!

Problems

The discovery of a large building with so many objects raises multitudes of questions which only long, patient research will begin to solve. The foremost of these, of course, is the date. This must be determined by collating the various lines of evidence: the stratigraphic position within the site, comparison with objects unearthed elsewhere, analysis of art style and iconographic content, analysis of carbon samples for radiocarbon dates, and the exploration of historical records for possible events related to the archaeological reconstruction based on the material culture. This is a long process and the conclusions at which one arrives apt to change a number of times before a final answer which satisfies all the evidence is found. The analysis in this case is made more difficult by the fact that many of the artifacts are distinctive and do not lend themselves readily to comparison. The pottery in general ties the Burned Building and the Cemetery together, and connects them both to west central Iran where related pottery dates from 1000-800 B.C. The finer pottery types, found only in the building, suggest the possibility that the rulers of the town had a more special taste connected with a history somewhat different from that of the ordinary citizens. The types are certainly unique enough to justify a thorough inquiry into this line of investigation. At the same time, other objects seem to point to cordial re-



Glazed terracotta wall tile from Burned Building (upper right) compared with similar tiles from Assur (lower) where they are dated to the middle ninth century B.C.

PHOTOGRAPH BY LOOMIS DEAN, COURTESY LIFE MAGAZINE

View of West Court of the Burned Building showing two stone footing blocks for timber roof posts, and five pottery storage jars set in mud bench. Men stand on unexcavated balk separating excavation areas.

PHOTOGRAPH BY LOOMIS DEAN, COURTESY LIFE MAGAZINE

***The Joint Expedition** ends the season with the division of objects at the Museum of Ancient Iran in Tehran. By law, unique objects and half of the remaining objects (chosen by lot) belong to Iran. Archaeological inspectors Rad and Assefi discuss the material with Mr. Dyson.*

lations with Assyria during the ninth century B.C.—a high point in early Assyrian power. Nothing indicates trade with Urartu, Assyria's rival in eastern Turkey. Three radiocarbon samples from the burned stratum elsewhere on the site have produced dates of 807, 813, and 923 B.C. These dates and typological comparisons suggest that the sacking may have taken place toward the end of the ninth century B.C.

If we look at the historical records of this general time range in an effort to discover what kings are known to have campaigned specifically in this area, we find only one clearly documented candidate: Menua, King of Urartu. This king, while ruling jointly with his father Ishpuini, set up an inscription sometime between 815 and 807 B.C. near the city of Musasir in the Kel-i-shin Pass, about twenty-five miles due east of Hasanlu. During a period of Assyrian weakness a few years later, between 804 and 790 B.C., the same king when ruling alone set up a victory monument at Tash Tepe about 50 miles west of Hasanlu on the south coastal plain of Lake Urmia near the modern town of Miyanduab. This inscription celebrates the conquest of the Mannaean city of Meshta. The local geography and the location of these two inscriptions clearly indicate that Menua passed by Hasanlu sometime at the end of the ninth century. Such an event might well have been the cause of the holocaust which engulfed the city. It is interesting that, while numerous articles suggest Assyrian influence before the fire, nothing found so far makes such a suggestion for the later levels. On the contrary, at least one vessel points toward Urartu. After Menua, the next candidate would be Sargon II of Assyria a century later. At present there is nothing to suggest such a late date and we are left with what appears to be a perfectly plausible hypothesis in regard to Menua, but without adequate data upon which to base any firm conclusions.

It is to be understood, of course, that a date for the burning of the city does not give more than an *ante quem* date for the silver cup and the gold bowl—which are no doubt older. Indeed, the Grey Ware Period itself had a reasonable duration as indicated by the depth and superimposition of graves in the cemetery, and by the fact that the functioning of the burned building itself had been altered through the blocking of a doorway and the building of the storage-jar platform. How long did this Grey Ware Period last? Two radiocarbon dates give us an indication: one from below Burial 13, a deep Grey Ware burial in the cemetery, gives a date of 1025 $\pm$ 12 B.C.; while another date, from the stratum underlying the Grey Ware on the Citadel, gives 1042 $\pm$ 120 B.C. These, and the dates previously mentioned, suggest a time range of slightly less than three hundred years for the Grey Ware Period. Such a range is not inconsistent with the dates estimated for related materials elsewhere in Iran.

More Problems

The lot of an archaeologist is not an easy one. Especially when the public interest is aroused. Our first inkling of this fact came from reports received at the site from visitors. The story of our golden bowl reached Nagadeh, our market town seven miles away, and then swept up the valley. By the time it came to an end the beautiful bowl had been changed into the king's solid gold desk! The cable wires buzzed, and our quiet telegraph office blazed into action! We received the first telegram ever written in English by the operator. It provided great sport at morning tea when we read:

> NOWS ROLOUSO OUR TOMORROW PLOASE HOLD ALL PICTURES FOR LIKA OXCLUSIVO ALL HORO DOLIGHTODFRA.

A little thought translated this into—

> NEWS RELEASE OUT TOMORROW. PLEASE HOLD ALL PICTURES FOR "LIFE" EXCLUSIVE. ALL HERE DELIGHTED.
>
> [SIGNED] FRO.

We were enchanted! At the same moment the telephone from Philadelphia to New York was buzzing, and in a short time a well-intentioned cable was on its way to Paris heralding our modest discoveries. "Fabulous ancient city dripping with gold . . . " was the startling beginning of the unrecognizable story contained in the cable which was thrust into our hands by a weary photographer at the end of a two-day marathon around Azerbaijan trying to find us. Needless to say, we had been on one of our "four hour" drives to the railhead to meet him in response to a telegram which "superceded" a previous message which we had never seen. (But wonders of the East! It was delivered two days later at the bank in Tabriz only a hundred miles away from the address!) None of us had yet seen the "news release" referred to in Dr. Rainey's cable, and we developed what may best be described as a "dripping city" chill at the thought of the interpretations possibly given to our reports home!

It was not until a week later that the complete state of mental anguish which now engulfed us was dispelled in Tehran by the arrival of the news story as it had been released by the Museum and had appeared in the American press. We heaved a great sigh of relief and prepared for the journey home. Of such stuff is fieldwork made, and expeditions are rounded with their news release—especially when a bowl is golden.

The Hasanlu Bowl

EDITH PORADA

ONE glance at the gold bowl from Hasanlu with its varied scenes of gods, heroes, monsters, and men suffices to show that it ranks with the most significant works of ancient Near Eastern art now known. Its interest lies both in its rich iconography and in its lively, linear style, which makes full use of the metal worker's varied devices. The figures are in hammered relief; separate parts such as hair, limbs, garments, are bounded by lines; surfaces are differentiated by chased linear or dotted patterns. The execution of the designs shows such assurance and uniformity that the bowl must be the work of an experienced artist who belonged in the main-stream of a metal-working tradition. The problem which presents itself is the definition of that tradition in time and space. In other words, was the bowl made in a workshop at Hasanlu (or rather, in the unknown ancient town now being discovered by Mr. Dyson), or was it imported from elsewhere? Was it made shortly before it was buried, in the 9th century B.C., or was it an heirloom from an earlier century? Another problem arises in connection with the scenes represented on the bowl: are they motifs chosen at random from various sources for purposes of decoration, or is there a meaningful connection between them? Only a thorough analysis of the bowl's style and iconography can provide us with answers to these questions.

It is eight inches high with a diameter at the top of eight inches, and at the base also of eight inches. The thickness of the walls is greater than the photographs seem to show, namely three-sixteenths of an inch at the rim which is slightly tabbed at the top. Below is a double twist or guilloche seven-eighths of an inch wide, formed of triple strands with a dotted circle in each loop. A narrow groove separates the guilloche from the representations which decorate the body of the vessel. They are arranged in two registers which are merely divided by the imaginary ground line of the figures in the upper register. These figures represent three deities, each in a chariot of which the first two are each drawn by a mule, the third by a bull. Approaching the latter is a long-robed person, presumably a priest, holding a vase. He is followed by two men leading sacrificial animals.

All three deities appear to wear the same type of short-sleeved shirt over which a fringed shawl is wrapped. In the shirt of the second and third deity the round neck-line is indicated. All figures except the priest have long hair, marked by parallel gently curving lines converging in the back. Joints are indicated by double lines, only the elbows are marked by concentric curves, the ankles by circles. Foreheads are low, noses given varied shapes, occasionally jutting out prominently; lips are only a slight incision in the lower half of the face which is covered by a short beard. Again the priest differs from the other figures by having his hair brushed up in a forelock and shaved in the back where the stubby skin is shown, as it is also on the shaved cheeks and chin. In all figures the eye is enclosed by two curving lines, the upper one rising more steeply with the apex usually but not always off center and closer to the nose, thereby approximating a profile rendering.

The chariots are light vehicles with six-spoked wheels and with a box open in the back and provided with a handle which the charioteer could grasp when mounting. The scene seems to represent the worship of and sacrifice to these three chariot-borne gods of whom the first may be a weather god because of his association with a bull which is the usual mount and adjunct of that deity in Asia Minor, Syria, and Mesopotamia from about 2000 B.C. onwards. The god

PHOTOGRAPHS BY LOOMIS DEAN, COURTESY LIFE MAGAZINE

is further distinguished by a fillet and by rays or flames emanating from his shoulders which recall representations of the Mesopotamian Sun-god Shamash pictured with such shoulder rays in the 23d century B.C. during the rule of the powerful Akkad dynasty. It is the second deity of the bowl, however, who is more likely to represent a sun-god because he wears a disk flanked by rays or flames on his head. The third deity has a headgear of crescent-shaped horns which may have been meant to render the horned crown of the Mesopotamian gods.

In the lower register, we find not one connected scene but several single motifs of which some fill the entire field while others are placed one above the other. The ground line of the lowest figures is a guilloche formed of a single strand. Below the first god is an archer who rests his large bow on his instep. He has an arrow-filled quiver slung over his shoulder and wears a kilt patterned in herringbone chevrons indicated here and elsewhere on the bowl by minute rows of dots. From the border at the bottom of the kilt hang numerous long-fringed tassels. He has long hair and his head is circled by a snake whose head projects forward in the direction of an eagle who carries a woman aloft. The motif immediately suggests the representation of the Mesopotamian Shepherd king Etana who flew to heaven on the back of an eagle and who can be found on seal designs of the Akkad dynasty, in the 23d century B.C., like the sun-god with rays mentioned above. Not only does the eagle carry a human figure (though here it is a woman, not a man), but the manner in which the snake on the archer's head points toward the eagle recalls the widespread motif of the enmity of eagle and serpent which is woven into the preamble of the Etana story.

Proceeding from left to right, the next motif is a goddess riding a lion. With one hand she holds the lion's rein and a mirror, in the other hand she carries a wand or spindle which has a bulbous top. A thin wedge-shaped design on each shoulder may indicate that she is shown wearing large pins. The fact that she is enthroned on a lion and holds a mirror associates her with the type of Western Asiatic goddess represented by Kubaba, the protecting goddess of Carchemish who is pictured on a relief of that North Syrian town, dated about 900 B.C., likewise holding a mirror and enthroned on a lion. That goddess, however, holds a pomegranate, or a spindle with the top shaped like a pomegranate.

For the motif below the goddess on the lion, which shows two heroes attacking a long-haired, frontally postured demon, a parallel in which weapons are thrust into his head, comes from Tell Halaf, a site situated on the northern frontier of Syria. In the North Syrian relief, however, the rendering is much more formalized than in the lively style of the Hasanlu bowl. Moreover, representation of details is so precise here that we can recognize the type of each of the three daggers separating the motif of the goddess on the lion from the motif of a male figure tendering a cup to an empty bull-footed throne. The middle dagger of the three is an especially well defined type with the lower edge of the guard forming a crescent. Such daggers were found in tombs in the region east of Hasanlu toward the Caspian Sea, dated in the 12th and 11th centuries B.C. One wonders about the reason for placing these three daggers in the field. Were they meant to represent an offering like the sheep brought above, or were the daggers themselves symbols of gods?

Below the daggers and the enigmatic group of the man and the empty throne an extraordinary scene takes place: a woman tenders a child to a seated male figure who eagerly stretches out his hand to receive it, while holding in his other hand a hammer, presumably his emblematic weapon. Precedents for the motif of offering a small human figure can be found in earlier Iranian art but probably had a different meaning than the one here intended. The next scene is the most dramatic of the entire bowl: a hero, human or divine, battles a male monster whose upper body emerges from a mountain. The hero wears his long hair tied with a fillet, like the weather-god above, and a chevron-patterned kilt from the lower border of which hang tail-like tassels. His hands are protected by small ribbed shields which seem to have the function of boxing gloves in the contest with the monster which has claw-like fingers (except for the thumb) and only three shown on each hand. The mountain which protects the monster or which forms its lower body, rests on a crouching lion and ends at the back in an upward curving fishtail with three dog or wolf heads. The uppermost of these dog heads is partially surrounded by the flow of water spewed by the bull who draws the weather-god's chariot in the upper register. At this point a connection between the upper and lower registers is further stressed by the decoration of the background with small circles which reach from above to the back of the monster's fishtail. The association of the dog-headed fish-tailed part of the monster with water from the upper register suggests that it could have been thought of as a partly marine creature like the later Greek Scylla.

At the right of the monster and isolated by its bulk from the other figures is a goddess standing

on two rams, opening her chevron-patterned mantle to expose her nudity in a manner well known from Syrian representations of the second millennium B.C. The goddess wears a necklace with three pendent crescents, a type of pendant for which numerous parallels can be produced from Western Asiatic excavations.

It is tempting to associate the three last described scenes with a Hurrian myth preserved in Hittite translation dealing with the doomed attempt of a Chronos-like "Elder God" to retain his domination of the gods (and the world) in the face of the ascent to power by the vigorous and youthful weather-god. The following summary of the myth of Kummarbis is based on the translation of A. Goetze in *Ancient Near Eastern Texts to the Old Testament,* edited by J. B. Pritchard and published by the Princeton University Press. This "Elder God," Kummarbis, descends to the Sea where a rock gives birth to a son of the god. The "Good-women and the Mother-goddesses" attended at his birth and set him upon his father's knee. Kummarbis hatched plans for the child to "attack the Storm-god and tear [him] to pieces like a mortal" . . . to "shoot down all the gods from the [sky] like birds and let him break them to pieces [like] empty pots." He decides to place the child, whose body was made of diorite, upon the shoulder of a mythological personage named Ubelluris. There the child was to grow a cubit a day, one acre a month. Within a short time the diorite man had grown into the sky and had made the Storm-god's consort leave her temple so that she "could no longer hear the message of the gods nor could she see with her eyes the Storm-god. . . ." In a first encounter with the diorite man, the Storm-god appears to have been defeated but a second encounter must have ended in the Storm-god's victory over the diorite monster.

While the names of the deities of our bowl may be different from those of the myth just mentioned, the motif of the goddess, isolated (at least on one side) by the diorite man, the offering of the new-born child to his father, and especially the powerful battle rendered in the bowl with all the fury of a world-shaking contest even to the smirk on the face of the mountain-monster which reflects the diorite man's self-confidence as expressed in the myth, all correspond closely to the literary description. We may speculate therefore whether a myth celebrating the Weather-god's victory over a mountain and sea monster was woven into the ritual pattern of the people for whom the bowl was made and whether it was therefore used at certain solemn occasions when that victory was celebrated.

Having made some suggestions for the interpretation of the scenes on the bowl, we must try to determine its date and style. As shown in the course of the description of the single motifs, association of specific details with dated objects from other regions weighs heavily on the side of a date before 900 B.C. rather than for one in the later 9th century, the level in which the bowl was found. Aside from these associations to which many more could have been added, there are two considerations which point to a date between 1100 and 900 B.C. rather than before or after those dates. The reason it is not likely to have been made later is that there is no evidence of the pervading influence of the Neo-Assyrian Empire, so noticeable in other objects found at Hasanlu and so strongly reflected in the works made elsewhere on the periphery of the Assyrian Empire from the 9th to the 7th centuries B.C. This also applies to the type of chariot pictured on the bowl which is of the light type represented in monuments of the second millennium B.C. rather than the heavy Assyrian type which prevails after the early 9th century B.C. Lastly, the fringes of the shawls in which some of the figures of the bowl are swathed are not long and softly undulated as in the Neo-Assyrian renderings, but resemble the short and pointed fringes found on an altar of the thirteenth century king of Assyria, Tukulti Ninurta I (1263-28 B.C.). Yet the style of the bowl does not conform to the subtle modeling found in that earlier Assyrian monument, but is more linear in character. This is not a matter of technique alone but of artistic intent. A preference for linear over modeled rendering can be observed from Iran to Palestine in the 11th and 10th centuries B.C.

In addition to being placed in the general stylistic pattern of the period, the bowl can also be associated specifically with the style of Iran as known from the monuments of Susa, which always manifested a linearizing and patternizing tendency. This tendency is most obvious in the design on the bottom of the bowl which has four rams, indicated in outline only, walking around a checkered square. The whole design is enclosed within a finely hatched chevron border, a type of pattern which would be found more frequently after 1100 B.C. than before, while the double guilloche which circles the top of the bowl is an earlier motif. The single guilloche of the lower edge occurs both earlier and later.

It is not only the general affinity to the linear tendency of Iranian style which indicates that the bowl was made in that country, but also small details which reflect specifically Iranian customs and ideas. The richly braided hairdress of the female figures, for example, can be found in Susa

and Luristan as can the forelock of the priest in the upper register of the Hasanlu bowl. Furthermore, the manner in which the figures sit with their legs bent at the knee and presumably crossed, likewise corresponds to renderings from Susa. On a seal impression from Susa dateable about 2500 B.C. even iconographical predecessors of the Hasanlu figures can be found in goddesses seated on lions in the manner just described. The fact that the archer in the bowl sets his bow on his foot seems to reflect a specifically Iranian custom since we find it again in the two figures of a Late Achaemenian tomb at Qyzqapan, but not outside of Iran. Another element of the bowl for which Iranian associations might be claimed is the flight of the eagle who carries a woman toward heaven. This motif appears about seventeen hundred years later in post-Sassanian metal-work. Whether there really was a connection or not cannot be said without having some intermediate links.

Not only should we locate the bowl in Iran on the evidence just presented but, as a working hypothesis, also in the ancient town which the University Museum is excavating at Hasanlu. Another gold bowl closely related in style to that of Hasanlu was found in a grave at Kalardasht on the Caspian shore. It has three walking lions worked in the round and attached by rivets to the bowl. The style shows the same taut vigor in the rendering of the lions as in the Hasanlu bowl and also the mark of the swastika on the haunch. Kalardasht also yielded a dagger like the one with crescent design pictured on the Hasanlu bowl, but no other metal objects of the period which would point toward a flourishing industry in the vicinity. Hasanlu, on the other hand, seems to have had a continuous tradition of producing excellent metal objects.

An indication that we should not place the workshop of the bowl further to the northwest is given by the renderings of figures on a silver goblet found at Trialeti, east of Tiflis in the Caucasus. While certain details of costume and furniture such as the tail-like tassels of the garments and the bull's feet of the throne suggest some relationship with Hasanlu customs as reflected in the bowl, and while even the chinless short-bearded men seem like caricatures of the ethnic type found on the bowl, the style of the Caucasus vessel is stiffer, cruder, less accomplished.

The bewildering number of works of art with which the bowl from Hasanlu has been associated throughout these pages reflect the various sources of its style and iconography. These, however, can be assembled in several clearly defined groups and the results will give some suggestions for the elucidation of one of the least known periods of Western Asiatic development. The ancient Mesopotamian elements lead us back to the 23d century B.C. when the Akkad dynasty extended its rule over large parts of western Iran and when seals of the period found at Susa cannot be distinguished from those made in the Mesopotamian homeland. A residue of strong Akkadian influence may have lingered in the artistic repertory of western Iran. The second and most significant source of influence is North Syrian art of the late second and early first millennium B.C. The question arises whether this influence only came through minor works seen by the artists of western Iran or whether we should assume that they also shared a common background with their North Syrian colleagues. If the identification of the representations on the bowl with a myth like that of Kummarbis is accepted, their common background would be that of the Hurrians, a people located at several sites in northern Mesopotamia in the third millennium B.C. but coming to prominence there and in North Syria only in the course of the second millennium B.C. Further excavation will tell whether the remains of the peoples preceding those of the destruction level at Hasanlu give any basis for supposition of a Hurrian substratum at that site.

The third source of influence and connections is the Elamite monuments of Susa with which the Hasanlu bowl shares details of costume and of such technical devices as the use of dots and rings to differentiate surfaces. Numerous associations, furthermore, exist with the bronzes of Luristan. The date here assumed for the bowl, however, is earlier than that of these bronzes. Similarities in costume, hairdress, and even stylistic relations, may therefore be explained by common preferences in these two neighboring regions.

Lastly there are the connections with the Caucasus through the renderings on the silver goblet of Trialeti. As implied above, however, the workmen who produced the type of metalwork of which the Trialeti piece is an example may themselves have been influenced by Hasanlu rather than have contributed significantly to the Hasanlu style. These relations to the Caucasus area, however, constitute another point which Mr. Dyson's work will clarify.

The fact that he asked the present writer to contribute her ideas on the bowl instead of reserving the discussion of his most spectacular find for himself, is an example of the most generous type of scholarship. It emanates a glow as radiant as that of the gold bowl of Hasanlu itself.

Clever People, these Armenians

CARLETON S. COON

Deep in the oven-like summer of 1951 I was obliged, for reasons that have nothing to do with this story, to forsake the cool heights of Hamadan and make a trip by bus to Tehran. I came back as soon as I was able. Now in those days, and possibly still, it was the rule for passengers to bring their luggage to the bus station at five o'clock in the afternoon on the day before departure. In this way the bus could be loaded beforehand, and no one could show up at the last moment with a couple of trunks or a sheep or two when there was no more room. Dutifully enough I brought my modest suitcase to the station at the time indicated and had it checked in.

At five the next morning I woke up, with the horizontal rays of the sun just fingering through the poplars, and dressed quickly, for the bus was leaving soon. As soon as I was dressed my hostess, an American resident of Tehran, greeted me. She bore in her hand an object wrapped in a brown paper bag.

"Oh" she said, "I wish that you would take this to Frances X (another American woman residing in Hamadan); it is a can of lard. She loves to make pies. There is no Armenian butcher shop in Hamadan at all, and no way for her to get it unless I send it to her. I'm sure it won't be any trouble."

"Is it sealed?" I asked.

"Oh yes," she said.

So off I went to the bus station, with my package in my hand.

"What is this?" asked the despatcher, "You were supposed to bring all your baggage yesterday afternoon."

"I know," I replied, "and I brought my suitcase. This is just something that came up at the last minute."

"That's all right," said the driver, "you just sit in front with me and I will put it under the instrument panel."

Sitting in front made me happy, for Middle Eastern bus drivers are a temperamental lot, fond of racing each other around curves and taking chances that no Greyhound-pilot would consider. Being in physical reach of the switch and the hand brake always gave me a feeling of relative security. Sitting there in the seat of honor, so to speak, and seeing the vast expanse of the Persian plateau unroll before me, just in the finest moment of the day, made me feel that life was worth living, and a little more.

We had not been on the road more than an hour when I noticed several of the passengers holding handkerchiefs to their noses. Sure enough there really was some kind of unfamiliar odor in the air inside that bus. I drew a deep breath and there it was, the smell of that unclean animal, the common pig. It reminded me of Sunday mornings decades ago when my grandmother used to cook my grandfather codfish cakes for breakfast, with diced pieces of salt pork.

I looked down on the floor, and the rubber mat glistened with grease. We came into rolling country, and as the bus rumbled uphill the sea of hot fat swirled to the rear of the vehicle, and when we rolled downhill it flowed back under my very feet. Some of the passengers, who were wearing dainty shoes of different colors of leather, of the kind we call corespondents' shoes, were sitting with their knees to their chins, and their feet on the seats.

It is hard to imagine any single item of food in our culture that would annoy us by its odor the way that smell of lard upset the good Muslims who were my fellow passengers. Being Persians, they were exceedingly polite, but they were also exceedingly annoyed. The only point in my favor was that most of them had probably never before smelled pork fat, and may not have been absolutely sure what it was, but they undoubtedly suspected the worst.

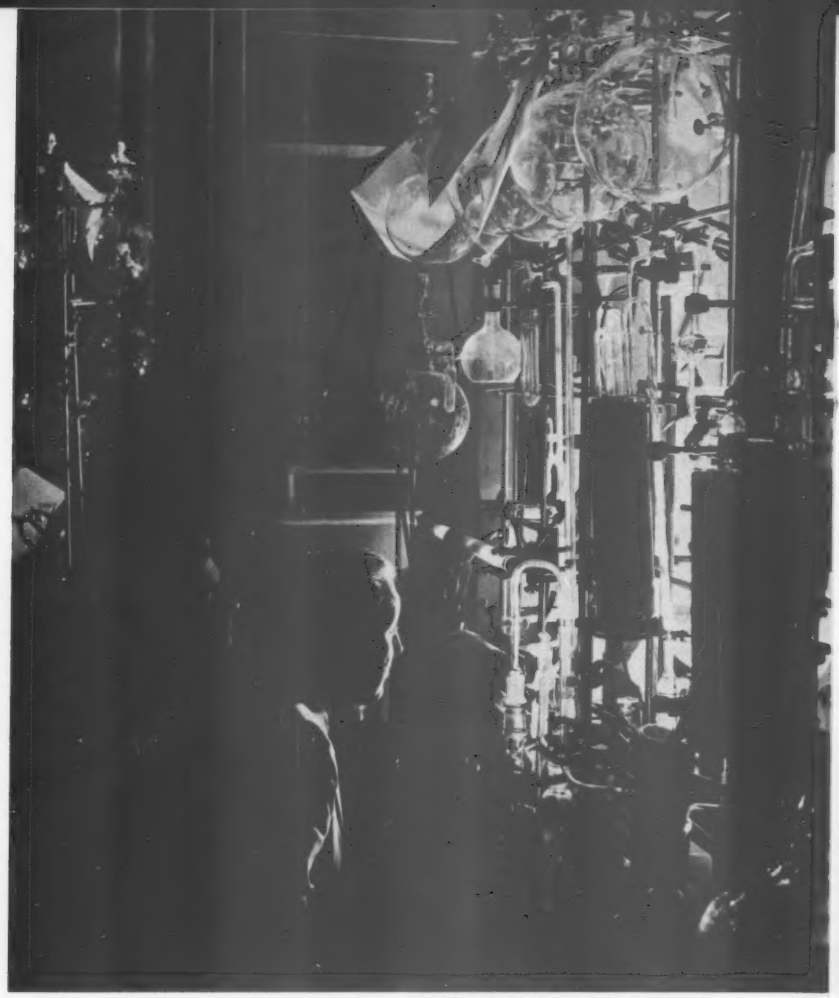
At this psychological threshold an Armenian, who was sitting right behind me, tapped me on the shoulder and said, in English and in a loud voice, "Why do you carry vegetable oil from Tehran to Hamadan, when it is cheaper in Hamadan, and it is rancid oil at that?" In case anyone missed the point, he explained to his neighbor what a foolish and extravagant man I had been in this vegetable oil business.

The bus driver pulled his vehicle along-side the road and the cleaner—the man who rides in the door and thrusts a wooden wedge under a rear wheel each time the bus stops—used the dust cloth with which he cleaned the bus, his own valuable handkerchief, and mine as well, to mop up the floor, and tossed the greasy package out. Then he threw away all the cloths he had used, and washed his hands in dust at the side of the road.

The bus rolled on. We had a race with another bus outside of Qazvin, and barely missed crashing into a heavy truck from Tabriz. These events diverted the minds of most of the passengers, I hoped, from their recent brush with pollution. When we got down at Hamadan the Armenian passenger walked past me, and on the side of his face which I could see a faint trace of a smile flashed for a fraction of a second.

Double Trouble

ELIZABETH K. RALPH



PHOTOGRAPHS BY REUBEN GOLDBERG

CONTAMINATION can be defined variously as pollution, defilement, taint, but to us in the C-14 laboratory it is just double trouble. This unfortunate duality arises from two sources—physical troubles and laboratory troubles. Archaeologists and anthropologists study and excavate in all parts of the world, then bring home or report valuable finds. More can be learned about these prehistoric finds when their ages are known, and it is with their collection that half of the C-14 troubles begin. To fix a chronology by the radiocarbon method, the sample must represent the age of the object to be dated; herein lies the physical problem. If the material is from Arctic regions, it may be a bit of charcoal or peat or antler, but roots from the incongruous lush growth on the surface of the land may have penetrated the subsoil so that our C-14 sample is not just a piece of charcoal but a composite of perhaps Denbigh Flint Culture charcoal infested with modern tree rootlets. We determine its C-14 age, but then what does the date represent—Denbigh Flint or modern rootlets or some indeterminate combination of both?

Fortunately, the physical problem is not always so ambiguous. We are now working with a long series of wooden lintels from the temples of Tikal, Guatemala where the University Museum is engaged in extensive archaeological work. These should be ideal—wooden beams that have been sealed *in situ* for more than a thousand years. However, in this case, we radioactive chronologers have a special problem. We take our samples from the outer parts of the temple beams because only the outside layers of a tree have contemporary C-14 contents. The inner parts have already ceased to replenish their radiocarbon even though the tree continues to grow. Therefore, if we do not use the outer portion of a temple beam or a minor structural member such as a young limb of a tree, the wood may have been several hundred years old when

it was used. If we add this century uncertainty to our C-14 date, then it is of no use in answering the current 260-year disparity in the correlation of the Maya calendar with ours. The solution of this physical problem is simple: take samples from the outer parts of the beams. But, Tikal is in a tropical region and the termites have thrived there. The surfaces of the Tikal temple beams are riddled with holes and the deposits of these insects who probably lived there long after the temples were constructed. Fortunately, this dilemma can be circumvented because the deposits are visible and the wood can be broken up into very fine slivers with each termite's hole exposed and his remains brushed off.

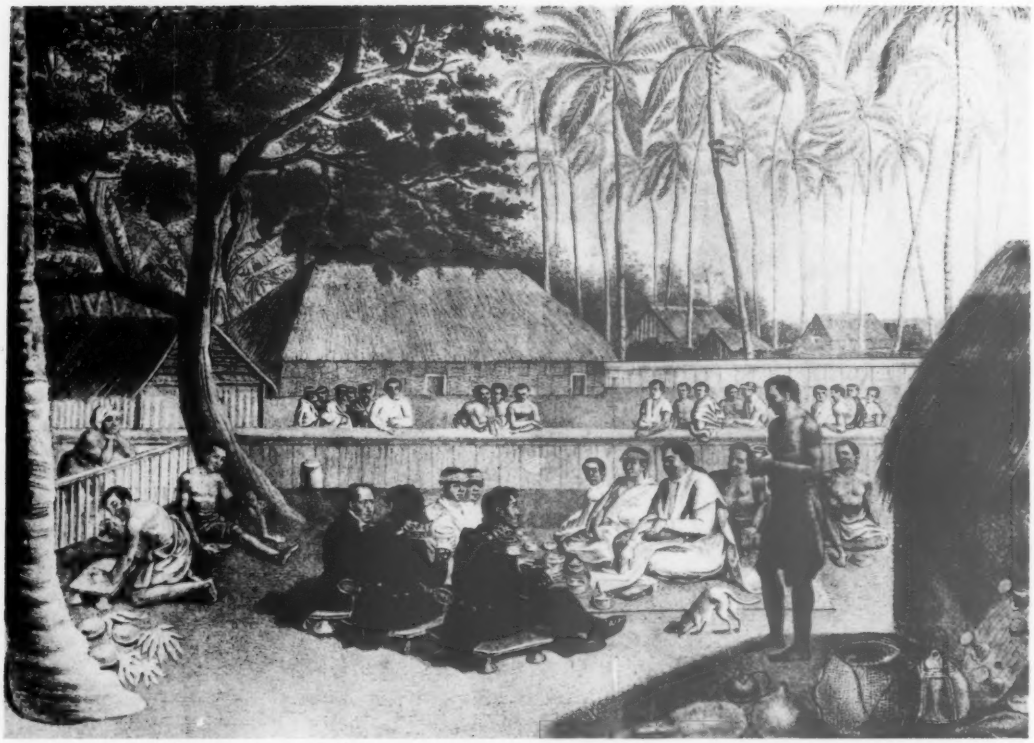
Bones, as dating materials, are less obvious sources of possible contamination. Bones have very low organic carbon contents and are complex molecules that are subject to chemical exchange. When bones have been heavily charred, however, the organic carbon concentrations are higher and less subject to ground water or atmospheric intrusion. This bone problem is exemplified in our series of dates from the High Andes in Peru and Bolivia. One obvious disparity is from the Tiahuanaco Site, level 9, where a C-14 date for a sample of charcoal was A.D. 256 $\pm$ 103 years and that for slightly charred bones from the same level, A.D. 732 $\pm$ 100 years—a discrepancy of five hundred years. Past experience indicates that charcoal is a more reliable material.

The physical problem is only half of the story; laboratory uncertainties provide the other. The standard laboratory errors are three-fold—statistical and the two control point calibrations. The $\pm$ tolerance quoted with each date is comprised of the statistical counting error (which cannot be avoided in counting random radioactive disintegrations) and the uncertainties in the "modern" and "background" control measurements at the time of the "unknown" determination. These last two are our calibration points which are essential for any C-14 date. With our new methods of carbon dioxide proportional counting, we can reduce these to five percent and with great care and stability of equipment, to two percent or less. However, before 1956, when we determined these dates by the solid carbon method, our usual error was of the order of plus or minus ten percent plus the additional hazard of "fall-out" contamination from bomb tests. Solid carbon is one of the best absorbers of gases, air, etc. and was therefore subject to artificial radioactivities from "fall-out." Two things have helped to minimize this hazard—the conversion to carbon dioxide, a gas which can be made and purified without exposure to the atmosphere, and "clean" bombs. A heavy "fall-out" no longer contaminates our natural C-14 counting gas, but could cause "background" fluctuations, that is, give us an erroneously high counting rate. For this reason and also because of the possible occurrence of cosmic ray showers due, for example, to sun spots, we run various monitoring devices in the laboratory. While these are not foolproof, they, at least, indicate when we should suspect the introduction of laboratory fluctuations.

The stability of our counting equipment is another problem and for this reason we make weekly checks of our calibration points, the so-called "modern" and "background" counting rates. When these are stable, when no "fall-out" nor cosmic ray shower has been noted, when the sample is representative of its age and no physical contamination has been introduced, then we have a C-14 date. Take it or leave it.

(Left) Robert Stuckenrath, research assistant in the C-14 laboratory, indicates the combustion tube to Dr. Alfred Kidder, II, Associate Director of the Museum. Combustion is the initial step in the conversion of an organic sample to very pure carbon dioxide. Purification traps can be seen in the right foreground. Flasks above are for the storage of carbon dioxide.

(Below) Dr. Kidder and the author observe the counts registered on a scaler. Other units are scalers and voltage suppliers. To the right is the carbon dioxide counter in the center of the steel shield. The Geiger counters, which surround it, comprise the anti-coincidence ring needed to reduce background.



The Voyage of Captain Bellingshausen to the Antarctic Seas 1819-21 . . . . THE HAKLUYT SOCIETY. LONDON. 1945.

"Breakfast with the King of Otahiti."

Te-moana-nui-o-Kiwa

The final article in a series about the finding and naming of some of the islands in the Pacific—the Maori great sea of Kiwa.

MARIANNE L. STOLLER

IN previous articles we have considered various discoveries made by five nations—Holland, Spain, Britain, France, and the United States. There is still a sixth country to be heard from—Russia.

Compared with the other nations, Russia was a johnny-come-lately on the South Pacific waters; most of the larger and more important islands and island groups had already been discovered, but the Russian navigators to some extent made up in quantity what they missed in quality. The first Russian expedition was that of Captain Adam Johann von Krusenstern between 1803-1806, but his expedition accounted for only one new discovery—Lisiansky (or Lisianski, Lassion, Laskar, or Pell)—a small islet in the northwestern chain of the Hawaiian Islands named for the captain of Krusenstern's second ship.

The most famous Russian navigator to traverse the South Pacific was Otto von Kotzebue, but most of his fame came from his Arctic explorations. The Russian navigator who made the most new discoveries was Admiral Thaddeus Bellingshausen, so I shall consider his voyage.

Bellingshausen's journals have been translated into English and published in two volumes by the Hakluyt Society, under the title, *The Voyage of Captain Bellingshausen to the Antarctic Seas 1819-1821*. He sailed from Kronstadt in 1819 and explored in Antarctic waters until the weather drove him north to Australia, New Zealand, and finally into Polynesia. Most of Bellingshausen's discoveries are in the Tuamotu Archipelago, for which he sailed with an avowed purpose:

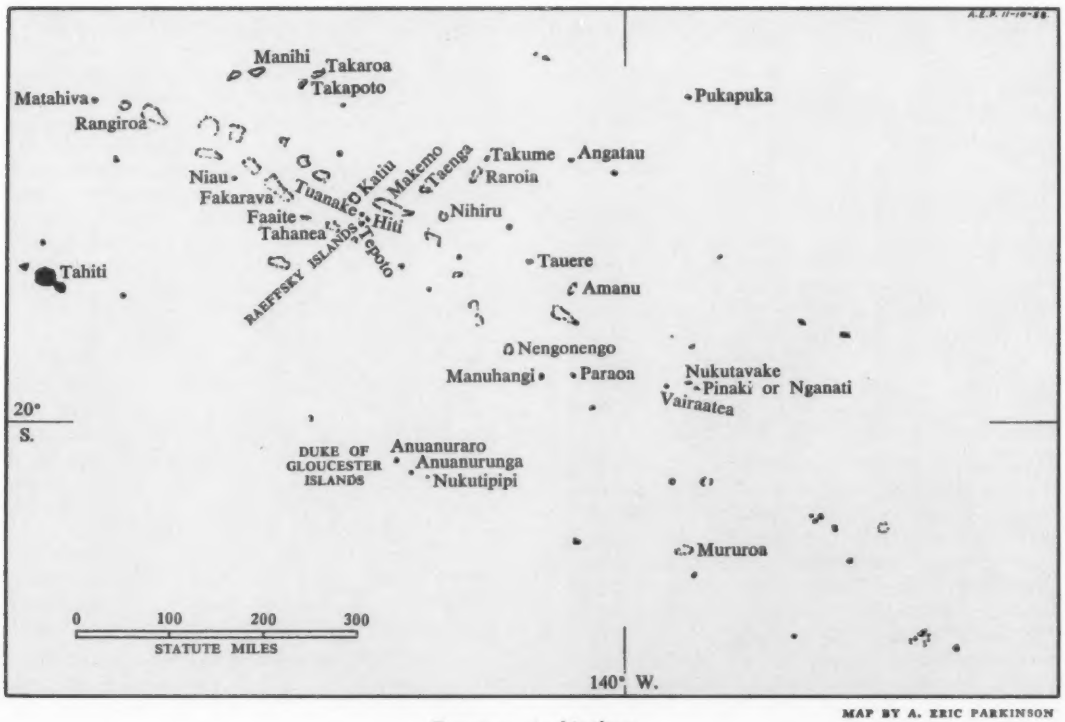
> . . . Thence I intended to continue, after passing to the east of the Society Islands, between that part of the ocean which Roggewein called the "Stormy Sea" and the Dangerous Archipelago, discovered by Bougainville. These names, so unpleasant to the nautical ear, have caused ships to avoid all these seas and therefore I counted upon finding islands or shoals as yet undiscovered . . .

Bellingshausen was a brave man to take sailing ships into the Tuamotuan waters strewn as they are with low atolls, reefs, and shoals; since their discovery they have become a vast graveyard for ships of all kinds. The first island he came upon was Amanu, discovered, unknown to him, by Andía y Varela in 1774, who named it "Isla de Las Animas." Bellingshausen says:

> . . . I called this island "Moller Island" in honour of Vice-Admiral Moller, under whose flag I had commanded the 44-gun frigate *Tikhvinskaya Bogoroditza*. . . .

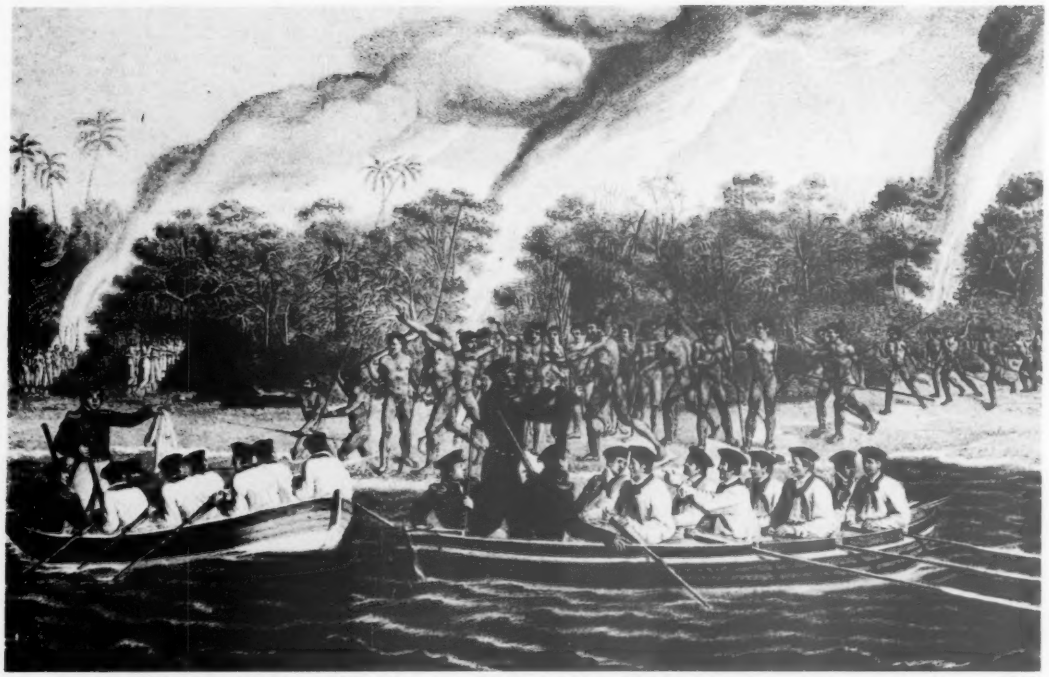
(Thank goodness he didn't name the island for the frigate!) His next discovery was Angatau, which he named "Count Arakcheev," and on the next day, July 12, 1820, he found "Prince Volkhonski Island," better known today as Takume. Close by was Raroia which he called "Field-Marshal Prince Barclay de Tolly Island." (Raroia received further fame not so long ago when the *Kon Tiki* raft crash-landed on its reefs.)

At the next island he located he had considerable contact with the natives and learned their name for it—Nihera, which is now usually spelled Nigeri or Nihiru. Oddly enough, the natives he found there were probably visitors, too, since the island does not now and may never have supported permanent inhabitants.



MAP BY A. ERIC PARKINSON

Tuamotu Archipelago



The Voyage of Captain Bellingshausen to the Antarctic Seas 1819-21 .... THE HAKLUYT SOCIETY. LONDON. 1945.

"View of the Coral Island of Moller [Amanu, Tuamotu Archipelago]."

After Nihera came "Lieutenant-General Yermolov Island," identified by one source as Makemo, and by another source as Taenga (or Holt), which is more likely. Actually, both of these islands had already been discovered although Bellingshausen didn't identify them as such. They were found in 1803 by John Turnbull and John Buyers, in the British ship *Margaret* (which gave her name to Nukutipipi, one of the Duke of Gloucester group). Turnbull had named Makemo "Phillips Island" in honor of the sheriff of London, Sir Richard Phillipps, and Taenga was named "Holt." If "Yermolov" is identified as Taenga, then the next island Bellingshausen came to was Makemo, which he named "Prince Golenitschev-Kutuzov-Smolenski Island."

Southwest of Makemo Bellingshausen found Tepoto (not to be confused with another Tepoto in the Tuamotus) which he called "General Raevski Island." This name, Raeffsky, is now applied to a group of three islands close together: Tepoto, Hiti, and Tuanake. In 1840, when the United States Exploring Expedition, under Charles Wilkes, was surveying the Tuamotus, this group was renamed "Seagull Islands" after one of the ships in the expedition and the individual islands were renamed "Chute," after the quartermaster (Tepoto), "Reid" (Tuanake) and "Bacon" (Hiti) after Passed Midshipmen. These names are not commonly used, however. After Raevski, Bellingshausen found Katiu which he entitled "General Graf Osten-Saken Island." His next discovery was Tahanea which he called after Admiral Chichagov (or Tchitschagoff) who had commanded the Russian fleet at one time in wars against Sweden. From Tahanea he had sighted Faaite (Bellingshausen's editor identifies it as Fakarava, but this seems unlikely to other authorities); this island he named "Graf Miloradovich" (or Myloradowitch) after a man who gained fame during the evacuation of Moscow before Napoleon's army. Another Russian military figure who was involved with Napoleon was commemorated at the next island: this is probably Fakarava, and Bellingshausen named it "Count Wittgenstein." Of his next find, Niau, he says, "I called this island, discovered by us, after 'Vice-Admiral Greig,' under whose command I served in the Black Sea." His last discovery in this area was Matahiva which he named "Lazarev" (or Lazareff, Lazaroff, or Lazarov) after the captain of the *Mirnyi*, his second ship.

After Bellingshausen extricated himself from the Tuamotus he sailed east and north and found an uninhabited atoll which he named Vostok after his own ship. Vostok is now clas-

sified as one of the Line Islands—a number of small, widely scattered, isolated islands that are assigned a group name more for convenience sake rather than geographical considerations. Although Vostok is nothing but a coral lump, less than a mile square, it managed to accumulate a number of names: Stavers, Reaper, Leavitts, and Anne. On August 7, 1820, he sighted Rakahanga, in the northern Cook Islands, and decided to call it "Grand Duke Alexander." (Mendaña may have originally discovered Rakahanga for he gave some island in its vicinity the name "San Bernando." In 1822 an American, Capt. Patrickson, thought he had discovered it and called it "Reirson"; similarly, Capt. Joshua Coffin, in the U. S. whaler *Ganges,* called it "Little Ganges" in 1828.

Sailing on, he missed the Samoan Islands but entered the Fiji group and encountered two small islands which he named "Mikhailov" (after the artist in his expedition) and "Simanov" (after his astronomer, who was a professor at Kazan University). These islands, in the Southern Lau group, are now known as Tuvana Ira and Tuvana Itholo, their native names. His most important find in the Fiji Islands was Ono (Ono-i-Lau), actually a group of six (ono means six) islands surrounded by one reef. On the western side of Ono he saw the reef on which his ship had nearly been wrecked at night and he named it "Beregis" or "Take care" reef. (It is now known as Vatua Ono—Ono's child). From Ono, Bellingshausen sailed for Sidney and the Antarctic again. He had been a modest man and named none of his discoveries for himself; however, his compatriot, von Kotzebue, on his second voyage honored him by naming the northwesternmost of the Society Islands Bellingshausen (they are also called Motu One).

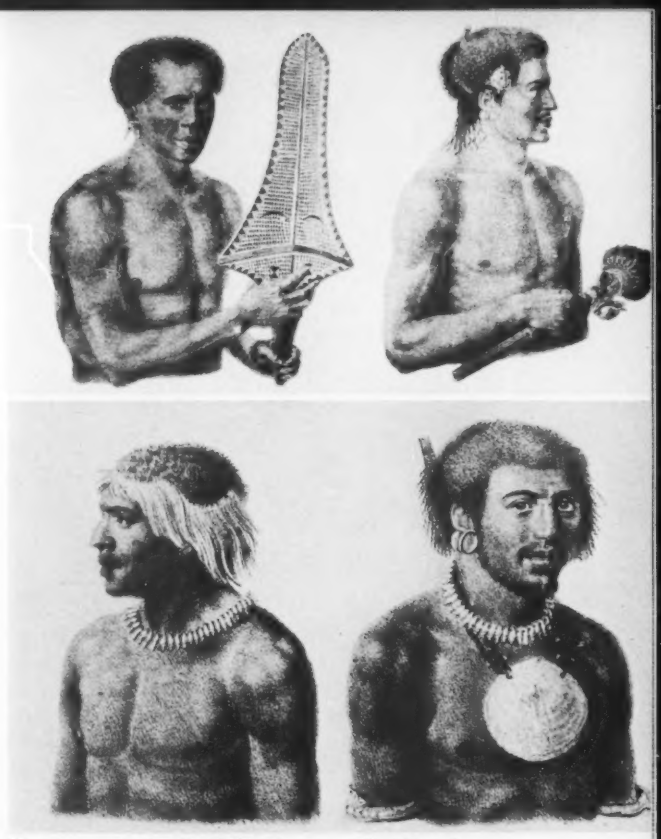
To summarize Bellingshausen's wanderings and namings together with other names:

In the Tuamotu or Dangerous Archipelago:
- Amanu: Moller, Amanou
- Angatau: Count Arakcheev, Arackcheef, Araktchev, Ahangatiu, Fangatau, Ahangatou, Aatao, Maroupa
- Takume: Prince Volkhonski, Wolkonsky, Wolkonski, Takoume, Takurea
- Raroia: Field-Marshall Prince Barclay de Tolly, Barclay de Tolly
- Nihiru or Nigeri: Nihera, Niheri
- Taenga: Lieutenant-General Yermolov, Yermaloff, Jermaeloff, Holt
- Makemo: Yermolov?, Prince Golenitschev-Kutuzov-Smolenski, Koutousoff, Phillips, Makima
- Tepoto: General Raevski, Ofiti, Eliza, Chute, Maurua
- Katiu: General Graf Osten-Saken, Saken, Katiou
- Tahanea: Admiral Chichagov, Tschitschagof, Tchitchagov
- Faaite: Graf Miloradovich, Myloradowitch
- Fakarava: Count Wittgenstein, Fakarawa
- Niau: Vice-Admiral Greig, Fa'aau
- Matahiva: Lazarev, Lazareff, Lazaroff, Lazarov, Mataiwa

In the Line Islands:
- Vostok: Vostock, Wostok, Stavers, Staver, Reaper, Leavitts, Anne

In the Cook Islands:
- Rakahanga: Grand Duke Alexander, Grand Duke Alexander Nikolaievich, San Bernando, Reirson, Little Ganges, Rakaanga, Rokahanga

In the Fiji Islands:
- Tuvana Itholo: Simanov, Simonov, Tuvana i tholo, Tuvana-i-tholo
- Tuvana Ira: Mikhailov, Mihailov, Michaelov, Tuvana ira, Tuvana-i-ra
- Ono: Ono-i-lau
- Vatua Ono: Beregis, Bereghis, Take care, Vauto Ono, Vauta Ono



The Voyage of Captain Bellingshausen to the Antarctic Seas 1819-21 .... THE HAKLUYT SOCIETY. LONDON. 1945.

"Natives of Ono Island [Ono-i-lau, Fiji Islands]."

The Voyage of Captain Bellingshausen to the Antarctic Seas 1819-21 .... THE HAKLUYT SOCIETY. LONDON. 1945.

"Natives of Grand Duke Alexander Nikolaievich Island [Rakahanga, Cook Islands]."

He proposed the title "Russian Islands" for the central and northern Tuamotus where he and others of his countrymen had made many discoveries, but this title never came into general use since the Tuamotus are one long chain of islands fairly close together and not readily divisible into geographic groups.

After perusing a detailed map of the various island groups many people, including myself, have wondered how it was that the early navigators sailed very close to some islands without ever seeing them, or else discovered one island and completely missed an adjacent one. Bellingshausen, for example, discovered Rakahanga but apparently never saw its sister island of Manihiki, only twenty-one miles to the south. He was off Rakahanga most of two days and one night in very good weather, he charted the island quite adequately, and most of the time stood off the southern extremity of it. However, both of these islands are low coral atolls (tree top elevation for Rakahanga is given at sixty feet and Manihiki is probably about the same) and cannot be seen from each other. This is only one example of a miss; there are many others, some of which involve high volcanic islands. Of course one can think of several obvious explanations of why explorers missed seeing islands they were close to: the weather was often an important factor, telescopes were not nearly as high powered then as they are now, and ships were not as large as most modern ships and were consequently much lower in the water. One historian, G. C. Henderson, was not content with the pat explanations and decided to experiment for himself. He was doing research for his book *The Discoverers of the Fiji Islands* and over a period of years he sailed among the Fijis (presumably in a motor-powered boat) duplicating as close as possible the conditions under which the explorers saw the islands. He followed the same courses, waited for comparable weather conditions, approached islands at the same time of day. His observations are very interesting and tend to exonerate the early navigators of those charges often leveled against them, of timidity, lack of tenacity of purpose, poor seamanship, inadequate reporting and charting, and purposeful misrepresentation. Henderson writes:

> My third reflection was that, though the information given by these commanders in their charts and log-books may frequently be at variance with actual facts, it is nevertheless *a true account of what they saw*. It is well known to us, and was, no doubt, to them, that the evidence of the senses is often misleading at sea; but as they ploughed their way through uncharted waters they had little or no time to make minute examinations. They had to trust very largely to their senses. The fact that their charts often differ very materially from modern charts does not mean they were careless or incapable men; it means rather . . . that, quite frequently, things are not as they seem to the voyager passing by. The sketch of the coast of Viti Levu [Fiji Islands], taken by Midshipman Langdale on the *Pioneer* in May 1932 from Bligh's position at 6 a.m. on May 8th, 1789, resembles the sketch on Bligh's little chart much more closely than a modern British Admiralty chart. The Admiralty chart is true to fact; the sketches by Mr. Langdale and Lieutenant Bligh are *true to what they saw* from that station point.

Perhaps we should not wonder that the early explorers missed islands which might have been hidden by haze or clouds or other islands, or charted reefs which don't exist because light from the moon shining on the ocean through rifts in the clouds suggests the appearance of a line of breakers; perhaps we should only wonder that they discovered some of the islands at all. And we can still marvel that they had names for all of them.

I don't know if it is possible to deduce any scientific theories of psychological or anthropological importance from it, but there does seem to be a tendency for the different nationalities to bestow different categories of names on their discoveries. Thus, I have already noted the predilection of the Spanish for naming their islands after saints and religious subjects; witness, "La Conversion de San Pablo," "Jesu Maria," "Lágrimas de San Pedro," "Asuncion," "Espiritu Santo," and so on. Similarly, the Dutch have been pointed out as being either descriptive of natural features or preferring the names of cities in Holland. The French are not so easy to categorize; they seem to exhibit at least two tendencies, one in a sort of romantic classical tradition exemplified by Bougainville and his "La Nouvelle Cythere" for Tahiti and "Les Grandes Cyclades" for the New Hebrides; the other, to name their discoveries for themselves.

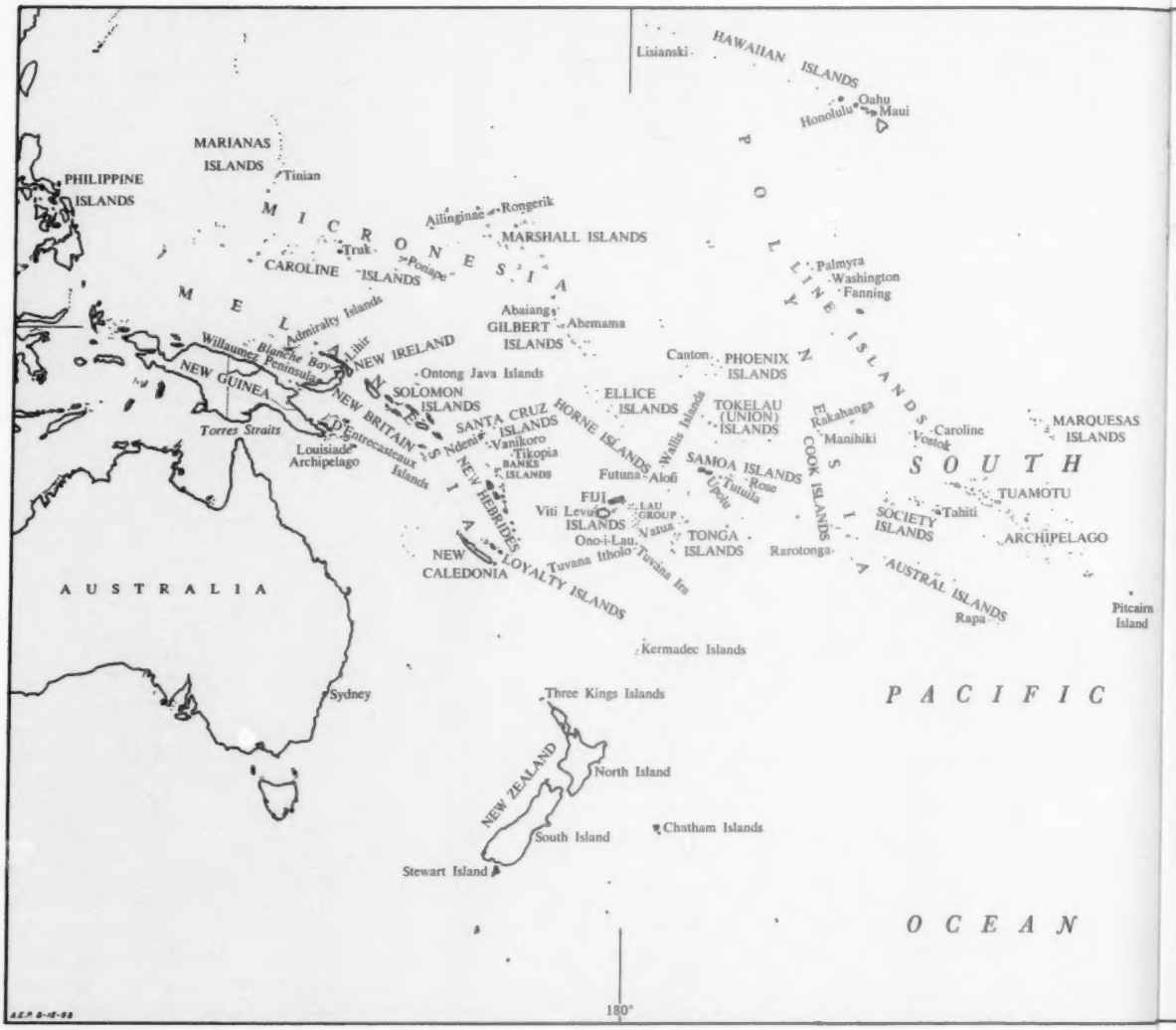
The Russians, as we have seen, tended to honor famous military figures and their royal family. At first glance I thought the Russians could receive credit for commemorating a musical composer; Otto von Kotzebue, in 1817, gave the name "Rimski-Korsakoff" to one of the Marshall Islands, either Ailinginae or Rongerik. However, the famous composer wasn't born until 1844 and the island was actually named for one of Kotzebue's lieutenants. There seem to be no names honoring musicians —there is no Bach or Beethoven or Haydn or Handel or Purcell Island. It would seem that, as might be expected, the South Pacific mariners were not men of the arts; neither are there any great artists honored (although a number of islands were named for the official artists on the voyages), nor is there a Voltaire or Shakespeare or Pushkin Island.

Certainly the principal name-giving tendency of the British was to dignify their discoveries with the names of royalty and the peers; they were, naturally, quite partial to the lords of the Admiralty. There are, for example, six dukes: Clarence, Gloucester (twice), and York (three times); there is at least one earl (Earl Dalhousie Shoal in the Carolines), and King George III was honored twice. Brigham lists four princes but only one is English—Prince of Wales in the Torres Straits. Turning to the lords, there are at least seven—Hood, Howe, North, and Salisbury, Howe being remembered four times; I believe they are all for the same Lord Howe who happened to be First Lord of the Admiralty during the main period of English exploration. British captains also liked to name islands for their expedition members and often rewarded the man who first sighted the island by naming it after him.

It might be expected that since these voyages were so long (usually two years or more) the women they left at home would be very much on the minds of these navigators. However, either they didn't consider their women important enough to name an island for, or they were sailors in the popular tradition and forgot about the ones they left behind. Anyway, whatever the reason, there are not too many islands with feminine names (if one excludes the Santas). There are five Elisabeths, three Elizas, two Janes, and one Sue. There seems to be only one Mary, Mary Balcout, which is now called Canton Island; I think it was named after a ship (which, of course, may have been named for a wife or daughter) as was at least one of the Elizas. Caroline fared better; besides the large group of Caroline Islands there is a Caroline in the Line Islands. Only two queens seem to have made it, and they were Charlotte and Maria Anna, (Mariana Islands) widow of Philip IV of Spain. It helped if the wife was along: Freycient, a French explorer, named Rose Island in the Samoans for his wife who was with him at the time.

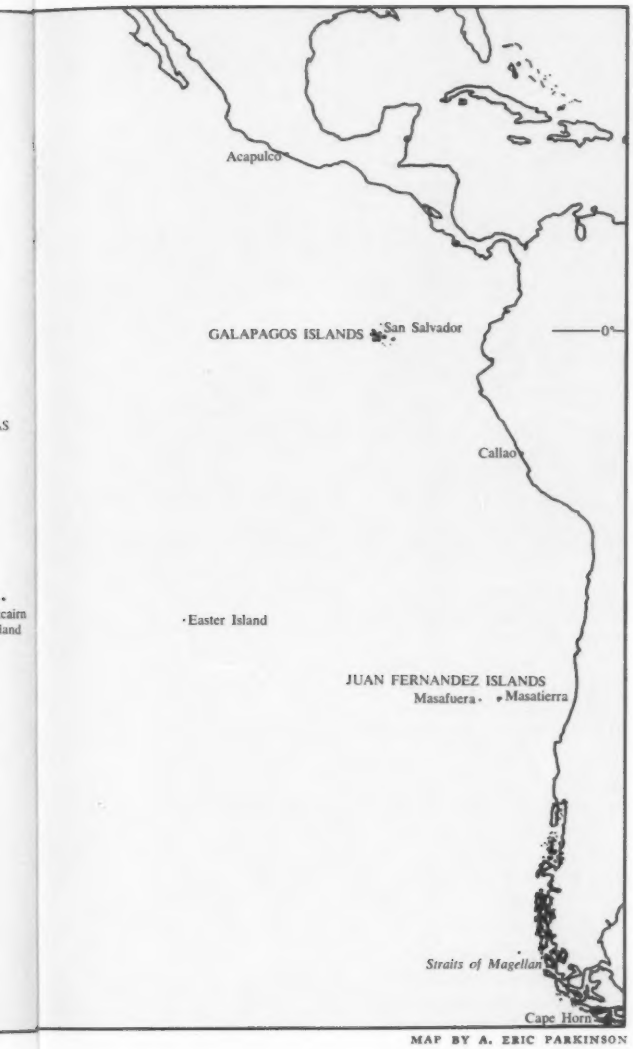
However, women shouldn't be hurt if they weren't remembered too often—they can think of how the Joneses must feel. There are at least three Smith Islands but not a single Jones could I find!

In naming islands the Americans, as usual, were rather eclectic. Like the Dutch they sometimes remembered place names at home (New York, Massachusetts, Nantucket), and like the French they sometimes remembered themselves (Fanning). Mainly, however, they seem to have followed the British tradition of naming islands for public figures (Washington, Adams, Madison). America's biggest effort in Pacific exploration was the Wilkes Expedition (officially the United States Exploring Expedition) between 1838 and 1842; it was, in fact, the largest of all Pacific expeditions, and it was also the last one of any importance. Admiral Charles Wilkes had six ships under his command and their purpose was to discover, explore and chart other discoveries, and make scientific collections. They did make a number of new discoveries, and charted a number of old



ones, especially in the Fiji and Tuamotu Islands, most of which they renamed. They adopted both the British and French tendencies to name islands after themselves; in fact, I think Wilkes must have gone down the muster roll of his expedition (officers and scientists first) when he handed out names. Few of them, however, stuck.

Of course there are many exceptions to these national tendencies (if such they are) in selecting names. The Spanish could be descriptive: one island, whereabouts now unknown, they named "Sin Puerto" because it had no port. The Portuguese, Ferdinand Magellan, called the Mariana Islands "Islas de las Velas Latinas" (Islands of the Lateen Sails) but his officers called them "Islas de los Landrones" (Islands of Thieves) because the natives stole from them. The Dutch occasionally named islands for people: Tasman named what is now called Lihir, off the coast of New Ireland, for a member of the Council of India, but his intentions were better than his spelling for he referred to it as "Gardenys" and "Gerrit de Nijs" on the same page of his journal (it has also been spelled Gardenijs and Gerrit Denys). Both the British and the French gave descriptive titles: Cook called the Tonga Islands the "Friendly Islands" because the natives were so nice to him (other navigators, to their sorrow, found this to be a misnomer) and Bougainville named the Samoan Islands "Iles des Navigateurs" because he was so impressed with the native canoes.



MAP BY A. ERIC PARKINSON

There were two things all of the namers-of-islands seem to have had in common: the navigators, no matter what their nationality, rarely forgot to honor their ships by naming an island after them, and many of them had a tendency to be repetitive with their names. Examples of repetition have been given before and there are many more: there are three Danger and one Dangerous (the Tuamotus); five Disappointment, five Goat (plus one Spanish one—Cabras), nine Green (including one Dutch Groene Eylanden), and three Sand, one Sands, and two Sandys (plus three Sandwich, all named, I suppose, like the Hawaiian Islands, for the Earl of Sandwich).

So far, we have been concerned only with the names given to the islands by their European discoverers. However, practically all of the islands in the South Pacific had been found long before the Europeans by the Polynesians, Micronesians, and Melanesians. Let's have a look at what the native inhabitants called a few of their islands.

It seems that they, too, were repetitive. There are at least four Motuiti in Polynesia, and the name simply means little island, or islet. There are three Pukapuka, but I don't know what that name means.

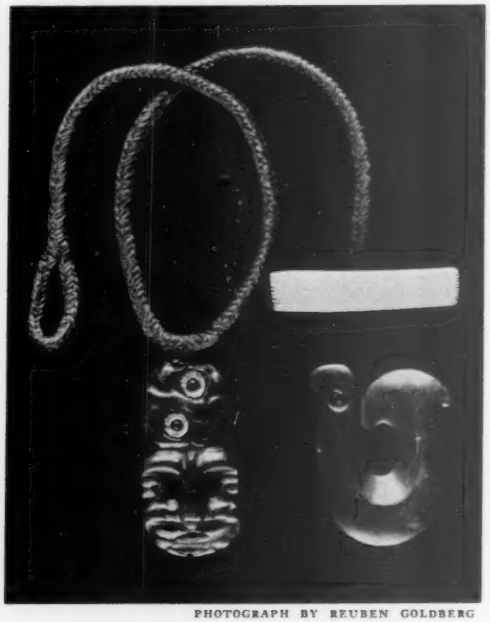
The Polynesian Maori probably discovered New Zealand sometime around A.D. 1000. They gave it a descriptive name—"Aotea roa," or "The Long White Cloud" for this is what it is supposed to have looked like as they approached it in their large sea-going canoes. The Maori have a myth (which I have taken from Sir Peter Buck's book, *The Coming of the Maori*) to account for the discovery of New Zealand and the naming of the two main islands. It seems that one of their gods, Maui, who was the youngest of five brothers and was always getting himself into trouble, stowed away in a canoe one day when his brothers went on a fishing expedition. When he was discovered he assumed command of the canoe and sailed it into unknown waters far south and west of their home (presumably some place in the Society Islands). Finally Maui selected a place to fish, but since his brothers would not share their hooks with him, he had to use the lower jawbone of his grandmother (which he just happened to have with him). He tossed this overboard and caught a huge fish —the North Island of New Zealand which was therefore called "Te Ika a Maui" or "The Fish of Maui." To balance the legend some traditions say that the South Island was called "Te Waka o Maui" or "The Canoe of Maui." The South Island was also named "Te whai Pounamu" or "The Place of Greenstone" since it is from the west coast of this island that the Maori obtained jade which they carved into *tikis* and other ornaments, and from which they made fine adzes and chisels.

Tales of the famous Maui are found all over Polynesia; he was a sort of culture hero and a trickster—almost the Till Eulenspiegel of the Polynesians. The second largest of the Hawaiian Islands is named for him.

The Tuamotu Islands, which have been mentioned quite often, derive their name from Tua, meaning ocean or open sea, and Motu, meaning islet, so the composite name can be translated Ocean-of-islets (Tua has also been translated as

FAMILY IN DUSKY BAY, NEW ZELAND.

JAMES COOK, *A Voyage towards the South Pole, and round the world . . . in the years 1772, 1773, 1774, 1775.* LONDON. 1777.



PHOTOGRAPH BY REUBEN GOLDBERG

Two pendants of New Zealand jade carved by the Maori. The little man is usually referred to as a tiki; the fish-shaped one is called hei matau.

cloud or bunch, so Tuamotu could mean Cloud-of-islets). An alternate name which is often used for the Tuamotus is Pa'umotu which means Shoal-of-islets. A number of the individual Tuamotuan islands have been considered, especially those discovered by Bellingshausen. Many of their native names can be translated into English, according to Teuira Henry's list in *Ancient Tahiti:*

Amanu—Float-away
Angatau—Keep-back
Takume—Beat-pulling
Raroia—Leaning
Nihiru—Hasty-beauty
Taenga—Arrival
Makemo—Slipping-out
Tepoto—The-short. An alternate name is *Maurua*—Hold-two
Katiu—Young-coconut
Tahanea—Siding
Faaite—Show
Fakarava—Make-dark
Niau—Coconut-frond. An alternate name is *Fa'aau*—Agree
Matahiva—Face-of-company
Nukutavake—Advancing-fleet

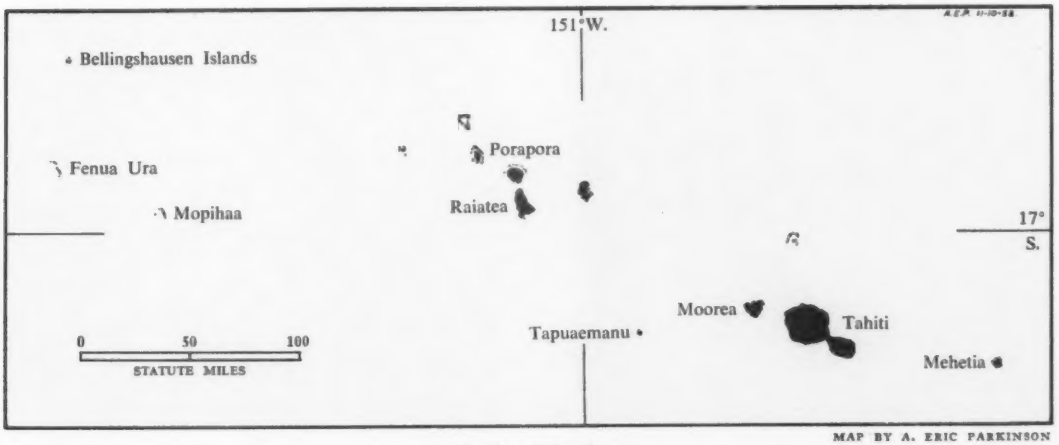
In the Society Islands there are also a number of names which have been translated by Teuira Henry. The principal island, Tahiti, is translated

as To-take-to-the-border; sometimes the natives also called it Hiti (Border) or Tahiti-nui (Great Tahiti—a name that is now used often to refer to the main part of the island while Tahiti-iti or Little Tahiti refers to the small peninsula). West of Tahiti is Tapuaemanu (or Tapu-a-manu or Tubuai-Manu) which means Sacred-to-the-birds. Two more of the islands discovered by Wallis are Mopihaa or Mopelia, which means With-springs, and Scilly which was once called Pu-tai —Sea-cluster or Birds-there—but which is now called Fenua Ura (whose translation I can only guess at: *fenua* means land and *ura* may mean to dance or to burn, or *'ura* means red and red feathers, once a sign of royalty).

Moorea, close to Tahiti, proves that the Polynesians, like the Europeans, sometimes gave an island more than one name. The name Moorea (properly spelled Mo'orea) is probably used most commonly now and means Offshoot; however, an alternate name Aimeo (or Aimeho or Eimeo) is still in use and it means Eating-in-retreat since this island was considered the retreat of fugitive Tahitian warriors. There is a poetic name for it too—Aimeo i te rara varu—or Aimeo of eight radiations, since the mountains divide it into eight natural divisions. Perhaps for the same reason it was also referred to as Fe'e or Octopus. Furthermore, it might also be called Tahiti-iti or Little Tahiti. Two more of the Society Islands, both discovered by Captain Cook, also have more than one name: the island now called Raiatea (Clear-sky) was earlier known as Havai'i or Invoked-space-that-filled and is identified in myths as the home or source of all the Polynesian peoples. The other island is Porapora (or Borabora or Bolabola) which means Firstborn since in traditional legends it was the next island created after Havai'i; it was famous as a place of brave warriors, hence its poetic names Porapora-i-te-hoe-manu, meaning Firstborn-of-silent-paddle, and Porapora-i-te-nuu-ta-rua, meaning Firstborn-of-the-fleet-that-strikes-both-ways. Its ancient name was Vavau.

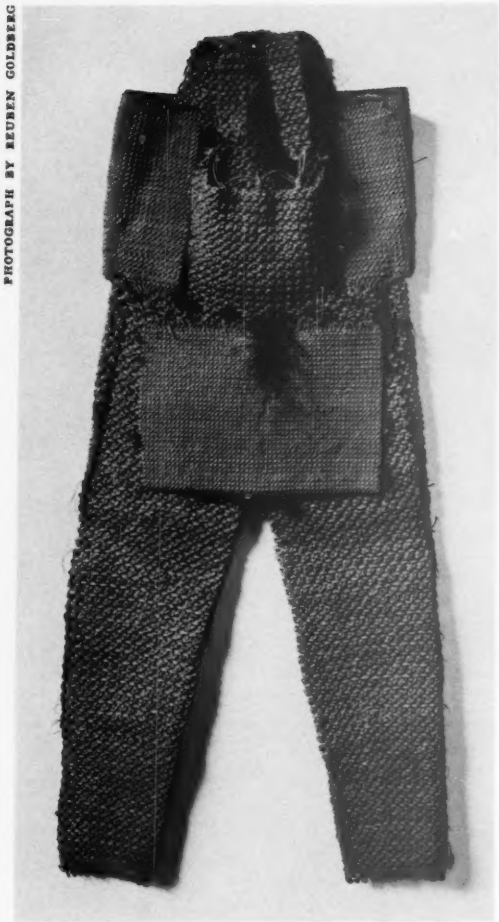
JAMES COOK, *A Voyage towards the South Pole, and round the world . . . in the years 1772, 1773, 1774, 1775.* LONDON. 1777.

"Man of New Zealand."



Society Islands

PHOTOGRAPH BY REUBEN GOLDBERG



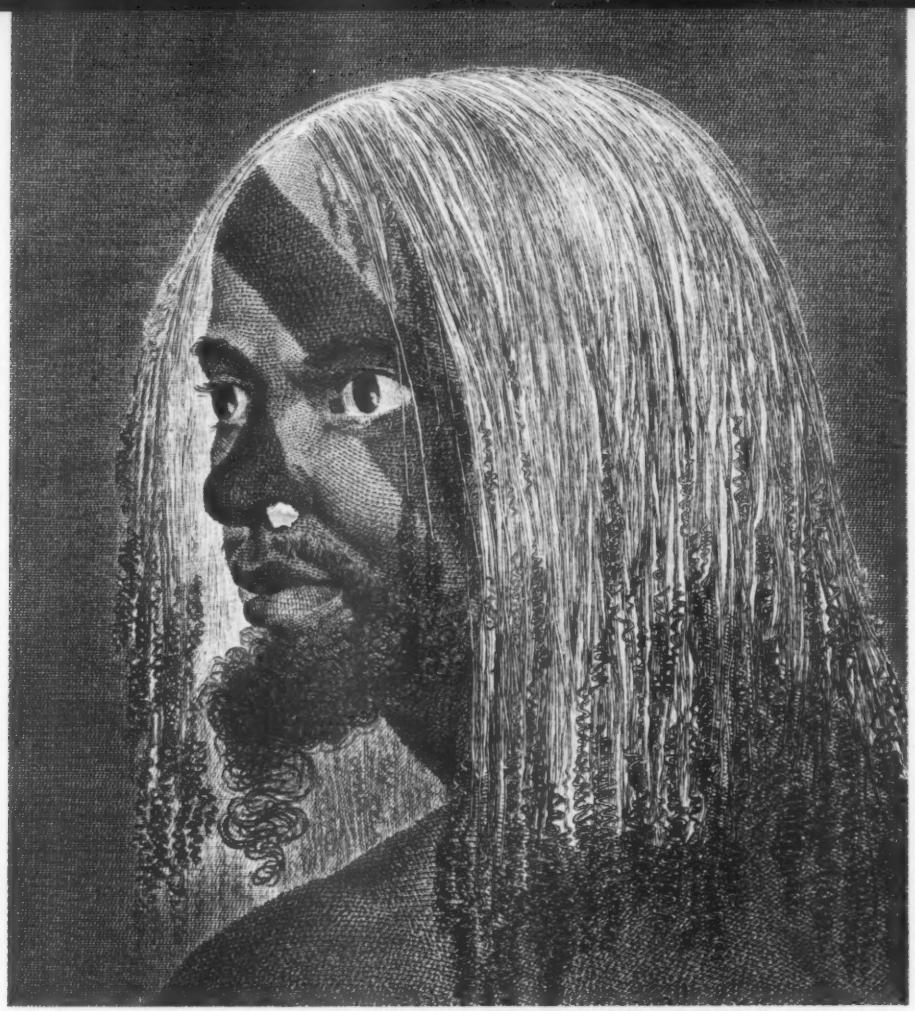
Suit of armor of coconut fibre tightly woven. Gilbert Islands.

The Micronesians, like the Polynesians, often seem to have named their islands for legendary events. For example, Ponape, in the Eastern Carolines, means On-the-altar and refers to a creation myth wherein two brothers pulled the island from the ocean to serve as an altar. The Micronesians, too, gave their islands names that are descriptive of natural features and that are poetic. Abaiang and Abemama, two atolls in the northern Gilberts, can be translated Land-in-the-Wind and Land-of-Moonlight.

The Micronesians and Polynesians resemble each other in many ways. Culturally and racially they are much closer together than either is to Melanesia. There are linguistic affiliations too, especially between the eastern islands of Micronesia (the Ellice group particularly) and Polynesia. The islands of both areas, whether they are volcanic islands or coral atolls, can be described as small in comparison with many of the islands of Melanesia. Generally speaking, the islands in both areas are "grouped" with large spaces of empty water between the groups (this is, of course, much more pronounced in Polynesia). Polynesia, as a whole, is a remarkably homogeneous area in culture and in language; Micronesians exhibit more differences between each other but still are relatively homogeneous in contrast to Melanesia. The first two share another characteristic—that of being excellent mariners with boats capable of long sea voyages, and with highly developed techniques of navigation when out of sight of land (like the Micronesian charts made of sticks and showing not only land but also currents and wind direction). In their views toward the "outer world" (that is, to other islands), the peoples of both areas might be called internationalists.

I have pointed out these similarities because in contrast to them the Melanesians might be called isolationists. As a unit, a culture area, Melanesia doesn't hold together very well; it is quite heterogeneous in race, in language and culture, and in geography. It would be incorrect to speak of the New Guineans, meaning the native people of New Guinea as a unit, as one can speak of the Tahitians. There are (literally) an unknown number of tribes in New Guinea separated spatially usually by mountains and separated otherwise by culture and language. The same situation exists on such other large islands in Melanesia as the Solomons, New Britain, and New Caledonia. Contact between these little pockets of people was usually restricted to highly formalized trade arrangements (often "silent trade") or to warfare. They were aware of their immediate neighbors, but in many cases their view of their world was a restricted one.

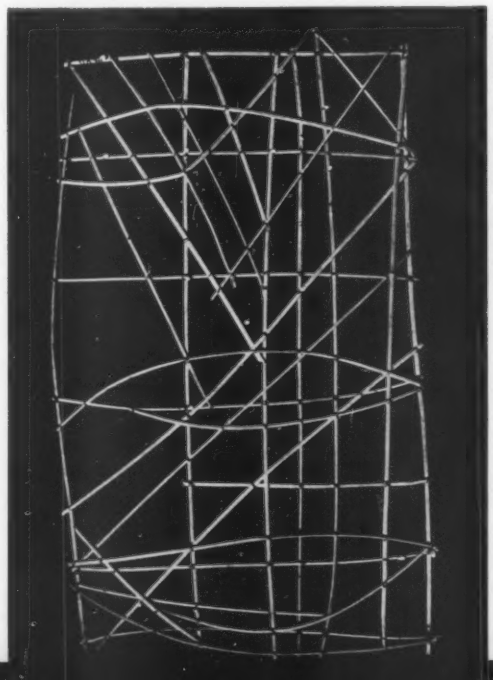
Perhaps this explains why many islands in Melanesia had no native name. A tribe had a name for the particular valley or area in which it lived, and for adjoining areas too, but not for the island as a whole. To give an example, the native name for the large island of Santa Ysabel in the Solomons is often listed as Mahaga or Bugotu, but actually Mahaga is a single village in Bugotu, which is only a district on Ysabel. This probably explains why the names given to these islands by Europeans have so often been retained, whereas in Micronesia and Polynesia native names have tended to re-assert themselves and are used much more commonly now. Codrington, an early anthropologist, in his book, *The Melanesians,* discusses this peculiarity of the Melanesians; he says that a visitor inquiring the name of a particular island may have been



JAMES COOK, *A Voyage towards the South Pole, and round the world . . . in the years 1772, 1773, 1774, 1775.* LONDON. 1777.

"Man of the Island of Tanna [Tana, New Hebrides]."

given the name of the village or section, or that of an islet between himself and the mainland, or even the name of a man of the place to which he pointed! Thus, San Cristóval was called "Bauro" by Europeans, but that is only a name of a part of it, and a village on the same island was called by the name of its chief and not by the native name for it. Florida was called "Anutha," because, pointing to it from the deck of his ship, Bishop Patteson, in 1862, asked a native boy its name and that is what the boy gave, but actually the name belongs to a small islet between Mboli and Ravu.

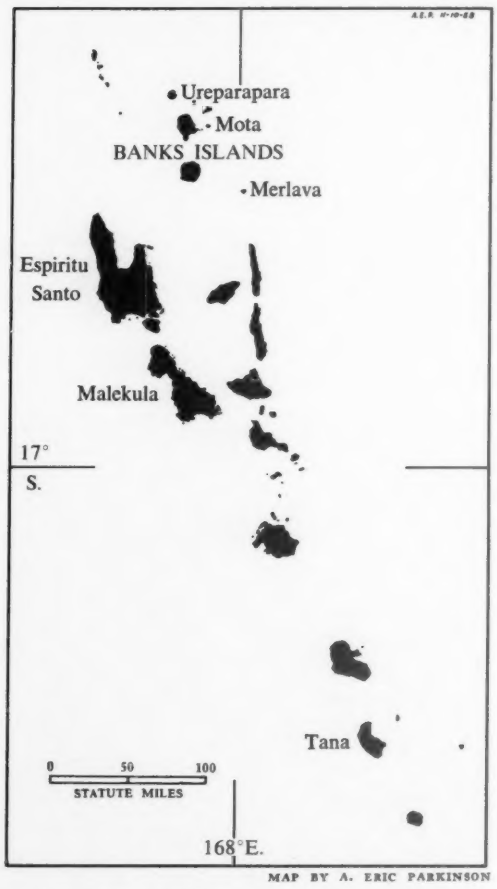


PHOTOGRAPH BY MERTEN GOLDBERG

Sailing chart from the Marshall Islands. The islands are marked by shells; the curved sticks indicate the direction from which the ocean swells come, and the straight sticks show the line of waves raised by the impact of two swells meeting.

JAMES COOK, *A Voyage towards the South Pole, and round the world . . . in the years 1772, 1773, 1774, 1775.* LONDON. 1777.

"The Landing at Mallicolo [Malekula], one of the New Hebrides."



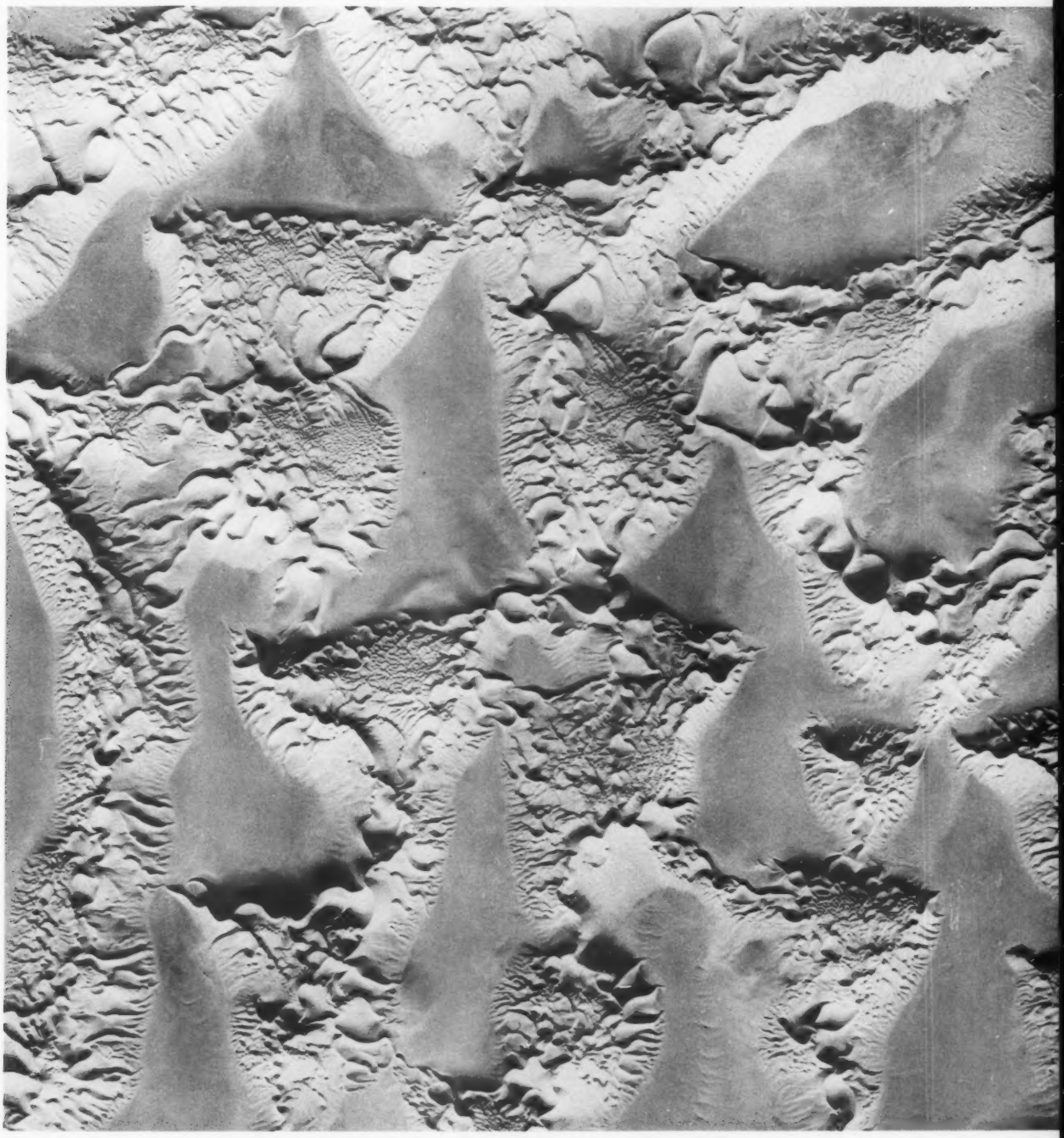
The New Hebrides and Banks Islands.

Not only were Melanesian tribes not very friendly with each other, but groups within a single tribe were also not always congenial. One of the characteristics which many of the Melanesians do share is a hostile, secretive attitude toward others. Codrington records that natives sailing between islands often wished to conceal their destinations from either real or potential enemies, so they used circumlocutions to refer to other islands. Some of these are: Mota (Sugarloaf Island) was known to a certain group of people as *Ure-kor* (the place full of dried breadfruit); Ureparapara (full of slopes) or Bligh Island was *Ure-us* (full of bowls); and *Ure-kere* (full of clubs) was a synonym for Merlava (Star Island or Star Peak). All of these islands are in the Banks Islands, a group in the New Hebrides.

Thus we have come the full round: from islands with too many names to islands with no names. Finally, the name of the ocean where all of these islands are might be considered. The story is told that the first European to see it was Vasco Nuñez de Balboa and he took possession of it for Spain and named what he saw from the shores of Panama the Golfo de San Miguel. Fernâo de Magalhâes, to give him the proper spelling, the first man to sail around the world (he really didn't—he was killed in the Philippines—but his expedition did) named the ocean *Mer Pacifico* because it was such a contrast to the rough and stormy Atlantic he had just crossed. Long before Magellan the Polynesians had named the ocean in honor of Kiwa, the mythological guardian of the ocean. The Polynesian Maori call it "Te-moana-nui-o-Kiwa," The Great Sea of Kiwa.

What in the World?

Can you identify the subject of this photograph?
Answer on page 40.



THE AUTHORS

SAMUEL NOAH KRAMER ("A Sumerian Document with Microscopic Cuneiform"), Curator of the Tablet Collection in the University Museum and Clark Research Professor of Assyriology at the University of Pennsylvania, is the foremost authority on Sumerian literary works. His study of the clay tablets on which this literature is written has taken him to the museums in Iraq, Turkey, and Russia, as well as to many in this country. From these scattered tablets and fragments he has been able to piece together such poems as *Gilgamesh and the Huluppa Tree, Lamentation over the Destruction of Ur, Enmerkar and the Lord of Aratta.*

ROBERT H. DYSON, JR. ("Digging in Iran: Hasanlu, 1958"), anthropologist and archaeologist, worked in the Southwest and Northeast United States between 1947 and 1950; was a Junior Fellow of the Society of Fellows, Harvard University from 1951 to 1954 and during that time did field work in South Africa, Jordan, and Iraq. He came to the University Museum in 1954 where he is the Assistant Curator of the Near Eastern Section. He was the Museum's representative on the Danish Expedition to Bahrein in the Persian Gulf and will be leaving shortly for his fourth season as Field Director of the Hasanlu Expedition.

EDITH PORADA ("The Hasanlu Bowl") obtained her degree in Vienna with a dissertation on early Mesopotamian seals. These small engraved seal stones, which are the only type of material recovered from all periods in western Asia and which form the framework for the major art works of the area, have remained her especial interest. Among her books dealing with them are *Seal Impressions of Nuzi, A Corpus of Ancient Near Eastern Seals in North American Collections,* and *Mesopotamian Art in Cylinder Seals.* While her particular field is the ancient Near East, Dr. Porada knows well the art styles of many other areas and times. She has taught history of art at Queens College and is at present a member of the Department of Fine Arts and Archaeology of Columbia University.

CARLETON S. COON ("Clever People, These Armenians"), Curator of General Ethnology in the Museum and Professor of Anthropology in the University of Pennsylvania since 1948, received his Ph.D. degree from Harvard University and was a professor of anthropology there from 1934 to 1948. His interests and field work have ranged from physical anthropology to ethnography to archaeology, and from North Africa, the Balkans, Ethiopia, Arabia, Iran, Afghanistan, Syria, Central Africa, to the Far East and India, the locale of his latest trip. At the present moment, Dr. Coon is working on a book entitled *The Races of the World;* he has recently published *The Story of Man, The Seven Caves,* and *Caravan.*

ELIZABETH K. RALPH ("Double Trouble") graduated from Wellesley in 1942. For the next seven years, she worked for an electronics firm where her duties included control of electroplating and heat treating, design and supervision of electrical inspection equipment, development of electronic apparatus, and miscellaneous production engineering. The following two years she studied at the University of Pennsylvania for her M.S. degree in Physics. Since 1951 she has been on the staff of the University of Pennsylvania, first as research assistant and now as research associate in physics, in charge of constructing and operating the C-14 Laboratory.

MARIANNE L. STOLLER ("Te-moana-nui-o-Kiwa") did field work in New Zealand and the Society Islands in 1951-53 and was an assistant in the American Section of the University Museum 1954-56. She is a Fellow of the American Association of University Women and a Fellow of the Social Science Research Council, and is now working on her Ph.D. dissertation in the Department of Anthropology of the University of Pennsylvania. Her subject is early European contacts in some of the Islands of Polynesia and in the course of her work she deals extensively with the reports of the early voyages.

SUGGESTED READING

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EXPEDITION NEWS

TIKAL, GUATEMALA

Mr. Shook, Field Director of the Tikal Expedition, has just made an exciting discovery—a stela inscribed with a date thirty-six years earlier than that of Stela 9 at Uaxactun, until now the earliest known Maya inscription. Stela 9 was discovered in 1916. Our stela also antedates the Leyden Plate which is supposed to have been made at Tikal.

The Maya date of this new stela is 8.12.14.8.15, the equivalent of A.D. 291. Only the upper part of the stela was found, evidently not in its original position, and not associated with any particular building. Much of the carved surface, including a human figure, was badly eroded, but fortunately the Initial Series glyphs are in excellent condition.

GORDION, TURKEY

The Expedition began work early in March, with Dr. Young as Field Director and Ellen Kohler as his assistant. They will be joined by Machteld Mellink of the faculty of Bryn Mawr College as soon as classes there are over, and will continue excavating through the summer. They plan this year to dig down further into the large mound below the 8th century B.C. level where they had been working, in order to examine even earlier phases of Phrygian development.

EL-JIB, JORDAN

From May 25th to August 8th, the Joint Expedition of this Museum and the Church Divinity School of the Pacific will continue the excavations at El-Jib which has been identified as the Biblical city of Gibeon. This is the third Jordan Expedition; as in 1956 and 1957, Dr. James B. Pritchard will be the Field Director.

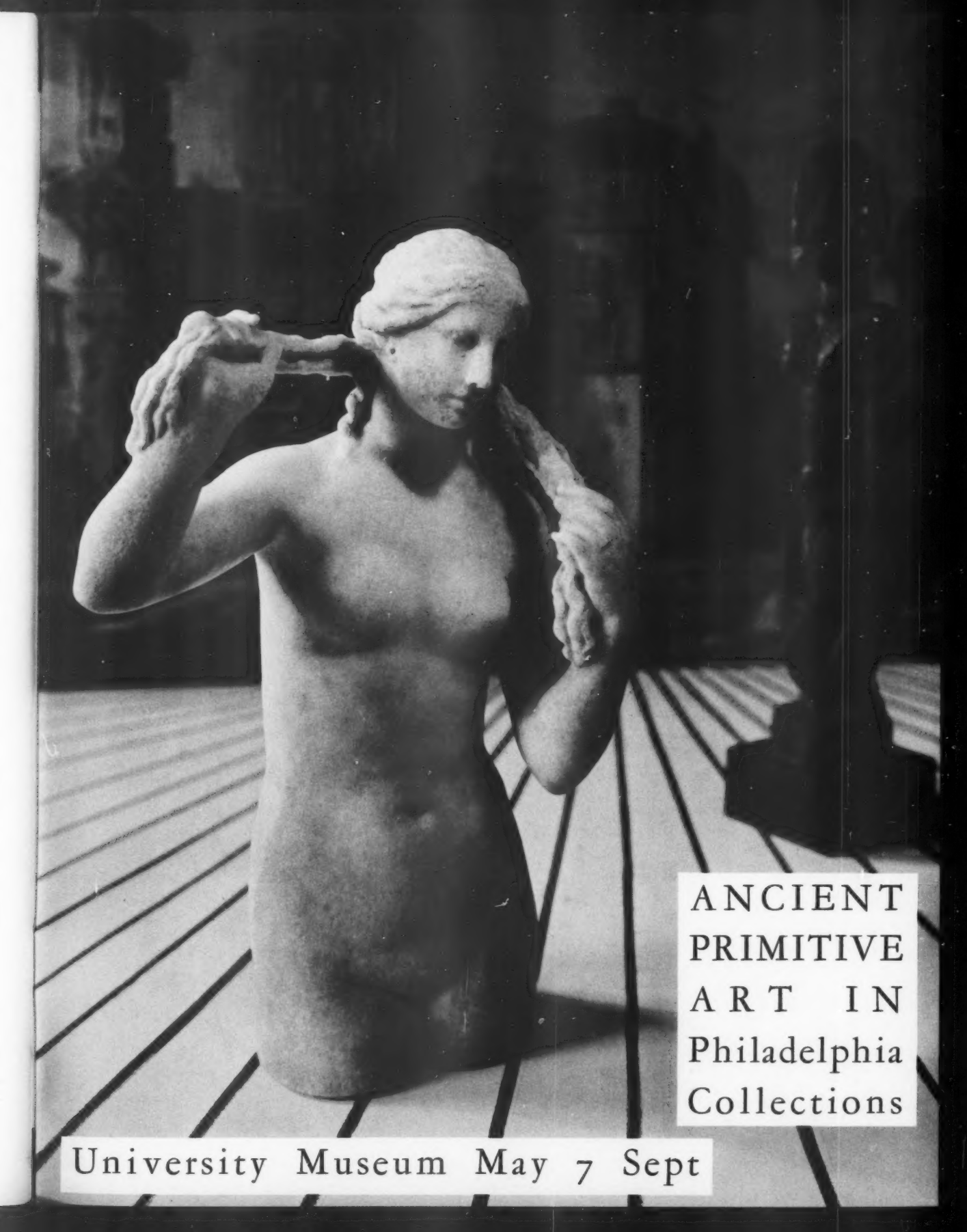
What in the World?

See page 39.

Did you recognize these sand dunes in the Libyan desert? Or were you as far off in your identification as those of us who suggested elephant foot prints, or a bucket of wet plaster, or a corroded bronze plaque enlarged a hundred times?

We are indebted to the Aero Service Corporation of Philadelphia for this photograph which they took from an altitude of 31,680 feet with a special camera equipped with a six-inch lens. The dunes range in height from 300 to 600 feet. This eighty-mile area lies about 200 miles southwest of the Sebha Oasis on the edge of the Rocky Desert.

The Aero Service Corporation made this photograph during a recent photo-mapping and geophysical survey for two major oil companies, who use such photos for reconnaissance purposes. Today, aerial photography is also playing an important part in archaeological work, both in locating sites and in obtaining an over-all picture of how they were laid out. Such a picture of Hasanlu in Iran appears on page 5.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